

**Libby Asbestos Superfund Site  
The Former Screening Plant and Surrounding Properties  
Operable Unit 2  
Lincoln County, Montana**

**Operations and Maintenance Plan**

USACE Contract No. W9128F-11-D-0023

Task Order No.: 0003  
EPA RPM: Dania Zinner

July 15, 2013

**Prepared for:**  
U.S. Environmental Protection Agency  
Region VIII  
1595 Wynkoop Street  
Denver, Colorado 80202

**Prepared by:**  
U.S. Army Corps of Engineers  
Omaha District  
Offutt AFB, NE 68113


and


CDM Federal Programs Corporation  
555 17th Street, Suite 1200  
Denver, Colorado 80202

**Libby Asbestos Superfund Site**  
**The Former Screening Plant and Surrounding Properties**  
**Operable Unit 2**  
**Lincoln County, Montana**

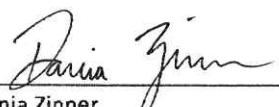
**Operation and Maintenance Plan**

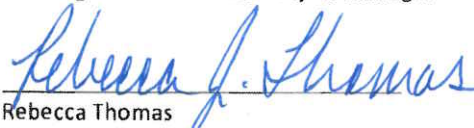
USACE Contract No. W912DQ-08-D-0018  
Task Order No. 0003

Reviewed by:  Date: 7/9/2013  
Marc Schlebusch, P.E.  
CDM Smith Senior Technical Reviewer

Reviewed by:  Date: 7/10/13  
Thomas Cook, CHMM, PMP  
CDM Smith Project Manager

Approved by: DARLING.MARY.N. 1231359717 Date: \_\_\_\_\_  
Digitally signed by DARLING.MARY.N.1231359717  
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI,  
ou=USA, cn=DARLING.MARY.N.1231359717  
Date: 2013.07.11 15:54:09 -0500  
Mary Darling, PMP  
USACE Project Manager

Approved by:  Date: 7/15/13  
Dania Zinner  
EPA Region VIII Remedial Project Manager

Approved by:  Date: 7/15/13  
Rebecca Thomas  
EPA Region VIII, Libby Asbestos Project, Team Lead

# Table of Contents

<b>Section 1 Introduction.....</b>	<b>1-1</b>
1.1 Site Location and Background.....	1-1
1.1.1 Former Screening Plant (Subarea 1).....	1-2
1.1.2 Flyway (Subarea 2).....	1-2
1.1.3 Private Property (Subarea 3).....	1-2
1.1.4 Rainy Creek Road Frontages (Subarea 4).....	1-2
1.2 Statement of Basis and Purpose.....	1-3
1.2.1 Operations and Maintenance Objectives.....	1-3
1.2.2 Summary of Long-Term Operation and Maintenance Activities.....	1-3
1.2.3 Summary of Five-Year Review Activities.....	1-4
1.3 Overview of Transition from Remedial Action to Operation and Maintenance.....	1-5
1.3.1 Schedule for Transition from Remedial Action to Operations and Maintenance ...	1-5
1.3.1 Access.....	1-6
<b>Section 2 Routine Site Inspection .....</b>	<b>2-1</b>
2.1 Routine Site Inspection Objectives .....	2-1
2.2 Observe Site Conditions.....	2-1
2.2.1 Inspect the Integrity of Covers.....	2-1
2.2.2 Inspect the Integrity of Engineered Controls .....	2-2
2.2.3 Other Site Features .....	2-2
2.3 Cover Maintenance Activities.....	2-2
2.3.1 Repair of Minor Breaches to Protective Covers.....	2-2
2.3.2 Repair of Major Breaches to Protective Covers .....	2-3
2.4 Future Encounters with Contaminated Soil.....	2-3
<b>Section 3 Monitor Institutional Controls.....</b>	<b>3-1</b>
3.1 Proprietary Controls .....	3-1
3.1.1 Establish Proprietary Controls .....	3-1
3.1.2 Evaluate and Update Proprietary Controls .....	3-1
3.2 Governmental Controls.....	3-2
3.2.1 Establish Governmental Controls .....	3-2
3.2.2 Evaluate and Update Governmental Controls .....	3-2
3.3 Enforcement and Permit Tools.....	3-2
3.4 Informational Devices .....	3-2
3.4.1 Establish Informational Devices .....	3-2
3.4.2 Evaluate and Update Informational Devices.....	3-3
<b>Section 4 Reporting Requirements .....</b>	<b>4-1</b>
4.1 Routine Reports .....	4-1
4.2 Special Reports.....	4-1
<b>Section 5 Cost Estimate .....</b>	<b>5-1</b>
5.1 Purpose and Intended Uses .....	5-1
5.2 Methodology and Organization.....	5-1

5.3 Cost Estimates Accuracy and Cost Uncertainty.....	5-2
5.4 Operations and Maintenance Cost Estimate.....	5-2
<b>Section 6 References.....</b>	<b>6-1</b>

## Appendices

Appendix A Detailed O&M Cost Estimate

## List of Figures

Figure 1-1	Operable Units (OUs)
Figure 1-2	OU2 Site Layout
Figure 1-3	Location of Protective Covers and Remedy Components at OU2
Figure 1-4	Location and Depth of Residual Contamination at OU2 Based on Investigation Activities and Removal-related Confirmation Soil Sampling
Figure 1-5	Location and Depth of Residual Contamination at OU2 – Parker Property Based on Investigation Activities and Removal-related Confirmation Soil Sampling
Figure 1-6	Location and Depth of Residual Contamination at OU2 – W.R. Grace Property Based on Investigation Activities and Removal-related Confirmation Soil Sampling
Figure 1-7	Location and Depth of Residual Contamination at OU2 – Wise Property Based on Investigation Activities and Removal-related Confirmation Soil Sampling

## List of Tables

Table 1-1	Summary of the Major Events for Transition from Remedial Action to Operations and Maintenance.....	1-8
Table 5-1	Summary of Probable Operations and Maintenance Cost.....	5-3
Table 5-2	Summary of Probable Operations and Maintenance Cost Incurred by EPA.....	5-3

## Acronyms

ABS	activity based sampling
ARD	Assessment and Remediation Division
ARAR	Applicable or Relevant and Appropriate Requirement
ARM	Administrative Rules of Montana
bgs	below ground surface
CA	cooperative agreement
CDM Smith	CDM Federal Programs Corporation
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
COC	contaminant of concern
CWCCIS	Civil Works Construction Cost Index System
DEQ	Montana Department of Environmental Quality
EM	Engineering Manual
EPA	United States Environmental Protection Agency
ERS	Environmental Resource Specialist
ft <sup>2</sup>	square feet
Grace	W.R. Grace Company
HASP	health and safety plan
IC	Institutional Control
ICIAP	Institutional Control Implementation and Assurance Plan
JSI	joint site inspection
KDC	Kootenai Development Corporation
LA	Libby Asbestos
MDT	Montana Department of Transportation
NCP	National Oil and Hazardous Substance Pollution Contingency Plan
O&F	Operational and Functional
O&M	Operations and Maintenance
OMB	Office of Management and Budget
OU	Operable Unit
OU2 site	Libby Asbestos Superfund Site Operable Unit 2
OSRTI	Office of Superfund Remediation and Technology Innovation
RA	Remedial Action
RAC	Response Action Contract
RAO	Remedial Action Objective
RD	remedial design
ROD	Record of Decision
ROW	right-of-way
RPM	remedial project manager
SSC	Superfund State Contract
Subarea 1	Screening Plant
Subarea 2	Flyway
Subarea 3	Privately-Owned Property
Subarea 4	Rainy Creek Road Frontages
USACE	U.S. Army Corps of Engineers

***This page left blank intentionally***

# Section 1

## Introduction

This Operation and Maintenance (O&M) Plan presents the administrative, financial, and technical details and requirements for inspecting, operating, and maintaining the Libby Asbestos Superfund Site Operable Unit (OU) 2 (OU2 site) Remedial Action (RA) at the Libby Asbestos Superfund Site (the Site)(Comprehensive Environmental Response, Compensation, and Liability Information System [CERCLIS] # MT0009083840) in accordance with guidance developed by the United States Environmental Protection Agency (EPA) for *Operations and Maintenance in the Superfund Program* (EPA 2001a). An O&M Plan is required at OU2 of the Site because an engineered control is employed to address contamination remaining at various levels within the Site.

OU2 is the subject of this O&M Plan and includes areas impacted by contamination in place from the former Screening Plant. Exposure to vermiculite and Libby Asbestos (LA) was largely mitigated by removal of surface soils and the placement of extensive soil caps across OU2 (known as the former Screening Plant Site) during removal activities. This O&M Plan was prepared to monitor engineered controls associated with remaining vermiculite and LA present in subsurface soil on the OU2 site.

### 1.1 Site Location and Background

The Libby Asbestos Superfund Site is located in and around the City of Libby, Montana. Libby is the county seat of Lincoln County and is in the northwest corner of Montana, about 35 miles east of Idaho and 65 miles south of Canada.

OU2 is located approximately 5 miles northeast of the City of Libby on the east side of the Kootenai River and at the confluence of Rainy Creek and the Kootenai River (Figure 1-1). The OU2 site was historically owned and used by W.R. Grace Company (Grace) for stockpiling, staging, and distributing vermiculite and vermiculite concentrate to vermiculite processing areas and insulation distributors outside of the City of Libby. The OU2 site is known as the former Screening Plant and Surrounding Properties. The OU2 site has been separated into distinct impacted areas. As depicted in Figure 1-2, these areas include the former Screening Plant (Subarea 1), the Flyway (Subarea 2), a Privately-Owned Property (Subarea 3), and the Rainy Creek Road Frontages (Subarea 4). The Highway 37 right-of-way (ROW) adjacent to the OU2 site was included due to its proximity to the OU2 site and the known contamination in the ROW. For the purposes of this O&M Plan, the contaminated portion of the Highway 37 ROW is considered part of Subareas 1, 2, and 3 within the OU2 site. These subareas are described in more detail below.

Exposure to the residual contamination was largely mitigated by removal of surface soils and the extensive cap placed across the OU2 site during removal activities prior to the Record of Decision (ROD), with the exception of two isolated locations within the Flyway (Subarea 2). Contamination in these two locations was addressed in 2010 during the RA for the OU2 site conducted in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 and the National Oil and Hazardous Substance Pollution Contingency Plan (NCP) (EPA 1994). Details of investigation and removal activities in the OU2 Subareas are provided in the Final RA Report (CDM Smith 2012). Figure 1-3 depicts the OU2 site remedy components. Currently, vermiculite, and LA are present in subsurface soil as depicted in Figures 1-4 through 1-7

### 1.1.1 Former Screening Plant (Subarea 1)

The former Screening Plant is located approximately 5 miles northeast of the City of Libby on the east side of the Kootenai River. The area is approximately 21 acres in size, and is bordered by Highway 37 to the northeast, the privately owned property to the southeast, the Flyway to the south, and the Kootenai River to the west. For the purpose of this O&M Plan, the Former Screening Plant area includes the Highway 37 ROW, which is adjacent to the west side of Highway 37. The ROW is used and maintained by the Montana Department of Transportation (MDT). The former Screening Plant property is currently privately owned and is being used for residential purposes. It is anticipated that the property will continue to be used for residential and/or commercial purposes.

The former Screening Plant has undergone extensive investigation and removal actions since the EPA began emergency response activities in the Libby area in 1999. Details of investigation and removal activities in the OU2 Subareas are provided in the Final RA Report (CDM Smith 2012).

### 1.1.2 Flyway (Subarea 2)

Currently owned by Kootenai Development Corporation (KDC) (a subsidiary of Grace), the area commonly referred to as the Flyway is comprised of approximately 19 acres northeast of the City of Libby, immediately south of the former Screening Plant and the privately-owned parcel. The Flyway is bounded by Highway 37 to the northeast, a residential subdivision (*River Runs through It*) to the south, the Kootenai River to the southwest, and the former Screening Plant and private property to the north. The Flyway is accessed through a gated entrance to the adjacent private property off Highway 37. For the purpose of this O&M Plan, the Flyway area includes the Highway 37 ROW, which is adjacent to the west side of Highway 37. The ROW is used and maintained by the MDT. The Flyway is currently vacant, undeveloped land. At this time, the owners have no plans to develop this property.

### 1.1.3 Private Property (Subarea 3)

The private property of Subarea 3 consists of an approximate 1-acre parcel situated between the former Screening Plant and the Flyway, and bordered by Highway 37 to the northeast. For the purpose of this O&M Plan, this private property includes the Highway 37 ROW adjacent to the west side of Highway 37. A continuation of the Flyway ROW, this ROW is used and maintained by the MDT. The private property is currently vacant, undeveloped land. At this time, the owners have no plans to develop this property. Details of investigation and removal activities in the OU2 Subareas are provided in the Final RA Report (CDM Smith 2012).

### 1.1.4 Rainy Creek Road Frontages (Subarea 4)

The Rainy Creek Road Frontages are currently privately owned and lie immediately north and south of Rainy Creek Road on the east (i.e., mine) side of Highway 37. Approximately 45,000 square feet (ft<sup>2</sup>) of land comprises the north frontage; approximately 39,000 ft<sup>2</sup> comprises the south frontage. For a short period, numerous trees were stored at the south frontage for use during restoration at the former Screening Plant. The Rainy Creek Road Frontages are currently vacant, undeveloped land. It is anticipated that the property will remain as such.

## 1.2 Statement of Basis and Purpose

The purpose of this O&M Plan is to present the activities necessary for inspecting, operating, and maintaining the effectiveness of the OU2 RA including administrative, financial, and technical details and requirements.



### 1.2.1 Operations and Maintenance Objectives

The implementation and maintenance of the remedial measures in accordance with the O&M Plan are designed to meet the following remedial action objectives (RAOs):

- Break the exposure pathways for inhalation of LA fibers that would result in unacceptable cancer risk or non-cancer hazard.
- Control erosion of contaminated soil by wind and water from source locations to prevent exposures and the spread of contamination to unimpacted locations.
- Implement controls to prevent uses of the OU2 site that could pose unacceptable risks to human health or the environment or compromise the remedy.

The ROD lists OU2 site specific O&M objectives as the following:

- Maintain the integrity of the engineered controls and protective covers.
- Monitor, evaluate and update institutional controls (ICs) to ensure protectiveness.
- Ensure that the protection of human health is maintained within the OU2 site.
- Prevent unrestricted use of the OU2 site (EPA 2010).

Long-term O&M and Five-Year Reviews will be conducted indefinitely throughout the life of the OU2 site because contaminants remain on the OU2 site at levels that do not allow for unrestricted use and unlimited exposure.

### 1.2.2 Summary of Long-Term Operation and Maintenance Activities

Long-term O&M will be performed to maintain the integrity of the remedy including protective covers and ICs. Prior to work on-site, an O&M health and safety plan (HASP) will be developed or an existing HASP will be adopted pertaining to the work required. All O&M work will be performed in compliance with the HASP. This plan will include provisions for responding to and reporting accidents involving site personnel, operating emergencies, and other unusual events such as fires, floods, or weather damage (EPA 2010).

The following activities will be considered routine O&M activities:

- **Routine OU2 Site Inspections.** Routine non-intrusive visual site inspections will be conducted to ensure integrity of the covers and backfilled areas. OU2 site inspections will be performed at least annually. Routine OU2 site inspections are discussed in Section 2.
- **Cover Maintenance.** Damage to protective covers and backfilled areas observed during routine OU2 site inspections will be repaired to eliminate exposure of underlying contamination. Cover maintenance is discussed in Section 2.3, including issues that may arise with the covers during long-term O&M and contingency plans for such occurrences.
- **Institutional Control (IC) Evaluation and Updates.** ICs will be evaluated on at least an annual basis and updated if necessary to ensure protectiveness. Evaluation and updates for different types of ICs are discussed in Section 3.
- **Reporting.** Routine reports summarizing O&M activities will be prepared on an annual basis. Routine reporting also involves regular review and updates as necessary to the O&M HASP as described in Section 2.2 and as-built drawings. Reporting requirements are discussed in detail under Section 4.

### 1.2.3 Summary of Five-Year Review Activities

Libby Amphibole Asbestos will remain onsite, above levels which allow unrestricted use of OU2. Five-Year Site Reviews of OU2 will be required to evaluate the implementation and performance of the remedy, and to determine whether the remedy remains protective of human health and the environment. The EPA is responsible for performing and funding the Five-Year Reviews as long as they are required. The Five-Year Review process consists of six components: 1) community involvement and notification, 2) document review, 3) data review and analysis, 4) site inspection, 5) interviews, and 6) protectiveness determination (EPA 2003).

- Community involvement activities will include notifying the community that the Five-Year Review will be conducted, notifying the community that the Five-Year Review has been completed, and providing the results of the review.
- Document review involves a review of all relevant documents and data to obtain information to assess the performance of the response action. Documents for review include, but are not limited to the OU2 ROD (EPA 2010), annual O&M reports, and annual IC evaluations.
- Data review and analysis will involve a review of sampling and monitoring plans and results from monitoring activities.
- Site inspections will be conducted to gather information about the site's current status and to visually confirm and document the conditions of the remedy, the site, and the surrounding area.
- Interviews may be conducted as necessary with the site manager, site personnel, and people who live or work near the site to gather additional information about the site's status or identify remedy issues.

When determining the protectiveness of the remedy, the Five-Year Review will include a technical assessment to examine the following three questions to provide a framework for organizing and evaluating data and information and ensure that all relevant issues are considered when determining the protectiveness of the remedy:

1. Is the remedy functioning as intended by the decision documents?
2. Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?
3. Has any other information come to light that could call into question the protectiveness of the remedy (EPA 2001a)?

According to the OU2 ROD, the remedial components will be subject to continual re-evaluation as part of the Five Year Review to ensure protectiveness of the remedy into the future. This will include any re-evaluation based on possible improvements to the technology to detect LA in soils and any new information gained from on-going Libby Asbestos Superfund Site Action Plan investigations. The remedy will be re-evaluated in accordance with the review requirements of CERCLA Section 121(c).

As described in Section 4, routine reports summarizing the Five Year Review will be prepared by the EPA in accordance with the *Comprehensive Five-Year Review Guidance* (EPA 2001b).

## 1.3 Overview of Transition from Remedial Action to Operation and Maintenance

### 1.3.1 Schedule for Transition from Remedial Action to Operations and Maintenance

Table 1-1 presents a summary of the major events for transition from RA to O&M at the OU2 site and associated dates of these events. See Section 1.1 for a summary of all investigation and removal activities that occurred prior to the ROD.

**Table 1-1**  
**Summary of the Major Events for Transition from Remedial Action to Operations and Maintenance**

Date	Event
May 10, 2010	ROD for OU2 Signed
July 28-30, 2010	Flyway Investigation
September, 2010	Remedial Design
September 27, 2010	Mobilization, site preparation & start of excavation
September 30, 2010	Remedial Excavation Complete
October 11, 2010	Remedial Restoration Complete
October 11, 2010	Final Restoration Inspection/Final Demobilization
November 3, 2010	Joint Site Inspection/Start of O&F Period
November 3, 2010	O&F Determination/Start of O&M Phase
November 10-11, 2010	Soil sampling to address action items identified during Joint Site Inspection
November 30, 2010	OU2 Joint Site Inspection Memorandum
February 4, 2011	Draft RA Report
February 4, 2011	Draft O&M Plan
April 20, 2012	Final RA Report
September 8, 2012	OU2 Post-Construction Risk Assessment Sampling
TBD	O&M Plan Approval
TBD	Institutional Control Implementation and Assurance Plan (ICIAP) Approval
TBD (estimated Summer 2013)	OU2 Post-Construction Risk Assessment Report
TBD (estimated Fall 2013)	O&F Determination/Start of O&M Phase
TBD (estimated Fall 2013)	First Annual O&M Site Inspection
TBD (estimated Fall 2013)	First Annual O&M Report
TBD (estimated Spring 2015)	First Five-Year Review

Annual O&M Site Inspections, Annual O&M Reporting, and Five-Year Reviews will be conducted indefinitely as long as contaminants remain on site at levels that call for limited uses and restricted exposure.

### 1.3.2 Access

Of the four OU2 subareas identified on Figure 1-2, only the former Screening Plant (Subarea 1) is actively used. All other subareas are undeveloped land with no current plans for future development. Subarea 1 is privately owned and used for residential purposes and it is anticipated that the property will continue to be used for residential and/or commercial purposes. All subareas include Highway 37 embankments maintained by the MDT.

Access agreements for conducting long-term O&M have not been obtained with land owners, but will be required with each property owner or agency (in the case of MDT) located within the OU2 site boundary. An example of a legal instrument which can be used to obtain access is an easement that provides access rights to and from a property for the purpose of inspecting and monitoring the cover system. One way this can be obtained is through implementation of Proprietary Controls as described in Section 3.1.

When intrusive work is required within the ROW to Highway 37, a permitting process will be followed. An example of this process is the MDT Encroachment Permits. Permitting (a governmental control) is discussed further in Section 3.2.

***This page left blank intentionally***



## Section 2

### Routine Site Inspection

Site inspections are conducted to provide information about a site's status and to visually confirm and document the conditions of the remedy, the site, and the surrounding area (EPA 2001a).

#### 2.1 Routine Site Inspection Objectives

Consistent with the O&M objectives presented in Section 1.2.1, the objectives of routine OU2 site inspections include the following:

- Observe and maintain the integrity of the engineered controls and protective covers
- Evaluate the implementation of ICs to ensure protectiveness as described in Section 3
- Ensure that the protection of human health is maintained within the site through maintenance of engineered controls and protective covers
- Prevent unrestricted use of the site (EPA 2010b)

#### 2.2 Observe Site Conditions

Monitoring protocol includes routine non-intrusive visual site inspections to ensure integrity of the covers, engineered controls, and changes or planned changes in land use. Site inspections will be performed annually as well as concurrently with Five-Year Site Review according to the proposed O&M schedule presented in Section 1.3.5.

##### 2.2.1 Inspect the Integrity of Covers

A non-intrusive (surficial) visual inspection of the immediate ground surface at the site will be conducted during the annual site inspection to determine the presence or absence of asbestos containing material or debris. The types and location of the remedial covers found on the OU2 site are depicted in Figure 1-3. A portion of the site along the Kootenai River in the Former Screening Plant Subarea 1 is covered with rip rap as an erosion control measure. The vast majority of the site was restored by backfilling excavations using clean soil brought from an offsite borrow source area outside the Libby valley. Above the backfill, topsoil was placed and hydroseeded for erosion control. In certain areas including the Highway 37 embankments, erosion control blankets were used to promote erosion control prior to the growth of vegetation.

Annual inspections will be performed every fall that will involve observing whether the covers and vegetation are intact and preventing exposure to asbestos containing material. Inspections will be conducted by persons properly trained in accordance with the Montana Department of Environmental Quality (DEQ) Administrative Rules of Montana (ARM) Rule 17.74.301-372. If asbestos containing material or debris is observed, the cover will be identified for repair as described in Section 2.3.

##### 2.2.2 Inspect the Integrity of Engineered Controls

The selected remedy as described in the ROD includes a potential need for engineered controls, such as fencing and or warning signs to restrict access to the seasonally flooded portion of the Flyway Subarea 2. This proposed engineered control was not constructed during the RA as described in the Final RA report (CDM Smith 2012). Engineered controls will be further evaluated as part of the OU2

post-construction risk assessment and may result in additional O&M responsibilities associated with OU2, if engineered controls around the Flyway are constructed.

The fencing depicted in Figure 1-3 around Subarea 1 was maintained during the RA to restrict access during construction. However, this fencing is not a component of the remedy and will not be considered as an O&M responsibility.

### 2.2.3 Other Site Features

The potable water well installed in Subarea 1, as described in Section 1.1.1, is not considered part of the OU2 site remedy. Therefore, the O&M of this well is the responsibility of the property owner.

## 2.3 Cover Maintenance Activities

Damage to protective covers could result from vandalism and/or unauthorized digging. In addition, flooding of the Kootenai River or Rainy Creek has the potential to result in surface exposure of LA from significant erosion of the covers in place. Damage to protective covers at the OU2 site can result in exposure to asbestos containing material that would result in unacceptable cancer risk or non-cancer hazard.

A minor breach of the protective cover occurs when a repair can be made without additional excavation of contaminated soil. A major breach of the protective cover occurs when significant exposure to contaminated soil beneath the cover may result and additional excavation of contaminated materials would be required. Prior to implementation of any corrective action, a task-specific Activity Hazard Analysis or separate task specific HASP will be developed.

In general, if LA is encountered or suspected while inspecting the protective cover at OU2, the entity performing O&M will:

- Take necessary measures to secure the disturbed areas so that the protection of human health is maintained through restriction of access to the area and limit contaminant migration from inadvertent activities.
- Contact the Environmental Resource Specialist (ERS) who will manage any contamination encountered. Section 2.4 further describes the responsibilities of the ERS.
- Take corrective action to repair the protective cover, as further described in the following subsections.

### 2.3.1 Repair of Minor Breaches to Protective Covers

General wear and tear or erosion of protective covers may result in a minor breach of protective covers. If the protective cover can be repaired without additional excavation of contaminated soil, it is considered a minor breach of the protective cover. This type of breach to a protective cover may or may not result in the exposure of asbestos containing material or debris from below the cover. This determination is to be made with input from the ERS.

Repair of a minor breach of soil protective covers will follow the general steps described below:

- Obtain clean soil from an offsite borrow source, outside of the Libby valley, that is analyzed in accordance with the Fill Material Sampling Technical Memorandum, Libby Asbestos Site (EPA 2012a) to ensure that they are both within specifications for the respective fill type and that they are not contaminated with LA.



- Transport, place, and compact backfill and topsoil.
- Hydroseed disturbed area as necessary.

As shown in Figure 1-3, excavations along at the Kootenai River were restored using rip rap. The disturbed areas were backfilled with common fill, then graded, and riprap was placed to prevent erosion of the creek and riverbanks during flood conditions. As necessary, repairs to minor breaches of rip rap protective covers will follow the general steps described above except that transportation and placement of rip rap will replace the transportation, placement, and compaction of topsoil and hydroseeding.

In the case that the O&M manual does not dictate materials and methods for the repair of a damaged protective cover, the materials and methods used for all new repairs will meet the performance standard requirements specified in the applicable OU2 remedial or removal action work plan for the original protective cover. In some cases, including the Highway 37 embankment, erosion control blankets may be required to prevent erosion until vegetation is established.

### 2.3.2 Repair of Major Breaches to Protective Covers

A major breach of the protective covers will result in significant exposure to contaminated soil beneath the cover. Additional excavation of contaminated materials may be necessary to secure the disturbed areas so that the protection of human health is maintained and contaminant migration does not occur.

If a major breach of the protective covers occurs resulting from a latent design or construction defect, EPA may require the design or construction contractor to repair the remedy or provide restitution in some manner (EPA 2001a). Repairs or restitution of major breaches resulting from future construction will be borne by the construction contractor.

In the case that the O&M manual does not dictate materials and methods for disposal of excavated contaminated soil and repair of damaged protective cover, the materials and methods used for all new repairs will meet the performance standard requirements specified in the applicable OU2 remedial or removal action work plan for the original protective cover.

## 2.4 Future Encounters with Contaminated Soil

If disturbance to the protective covers causes exposure, advice on how to address encounters with contaminated materials, will be obtained from the ERS. The ERS is a position currently staffed in the City of Libby by the EPA. Staffing of this position may be transitioned to another government entity when RA across the site is complete. In addition to providing advice and instruction, the ERS will manage any contamination encountered.

ICs such as informational devices, as described in Section 3.4, will be used to inform the public of proper actions to avoid and how to handle future encounters with contaminated soil.

***This page left blank intentionally***

## Section 3

# Monitor Institutional Controls

ICs are non-engineering measures designed to prevent or limit exposure to hazardous substances left in place at the OU2 site. As presented in the ROD Section 12.4.1, "ICs are considered an integral part of the remedy, so development and implementation of the ICs will be conducted as part of the RA." (EPA 2010).

EPA has developed an Interim Institutional Control Implementation and Assurance Plan (ICIAP) to ensure ICs applicable to OU2 are properly documented, implemented and operate effectively during their entire lifespan. In accordance with the interim final guidance, *Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Superfund, Brownfields, Federal Facility, UST and RCRA Corrective Action Cleanups*, the ICIAP identifies the objectives, performance goals, existing or anticipated enforcement documents and approaches for enforcement (EPA 2012b).

The ICs will be evaluated and updated on an annual basis. The routine and critical evaluation of the ICs will assess:

1. Whether the selected IC instruments remain in place.
2. Whether the ICs are enforced such that they meet the stated objectives and performance goals and provide protection required by the response (EPA 2012b).

The following sections present proposed ICs and maintenance procedures. ICs are more effective if they are layered, meaning the use of different types of ICs at the same location to enhance the protectiveness of the remedy (EPA 2000a). For example, where ICs must be effective for a long period, either proprietary or governmental controls will be considered because they generally run with the land and are enforceable. Also, the implementation of government controls might be considered a beneficial addition to information tools that may be forgotten over the long-term or an enforcement action that would be binding only on certain parties (EPA 2000a).

## 3.1 Proprietary Controls

Proprietary controls are created pursuant to state law to prohibit activities that may compromise the effectiveness of the response action or restrict activities or future resource use that may result in unacceptable risk to human health or the environment (EPA 2012b).

### 3.1.1 Establish Proprietary Controls

Proprietary controls involve legal instruments placed in the chain of title of the site or property.

### 3.1.2 Evaluate and Update Proprietary Controls

Both the administrative/legal components of proprietary controls as well as the physical evidence will be evaluated. One method to evaluate the administrative components of proprietary controls is to perform a title search on the properties within the OU2 area and determine if the land or resource use restrictions are appropriately documented in the chain of title of the property. Proprietary controls can also be evaluated during site inspections through physical evidence of property encroachment or possible violations of land or resource use restrictions.

## 3.2 Governmental Controls

Governmental controls, such as MDT encroachment permits, impose restrictions on land use or resource use (EPA 2012b).

### 3.2.1 Establish Governmental Controls

Local governments have a variety of land use government controls to limit land or resource use including zoning restrictions, ordinances, statutes, or building permits (EPA 2000a). However, once implemented, local and state entities often use traditional police powers to regulate and enforce the controls. Since this category of ICs is put in place under local jurisdiction, they may be changed or terminated with little notice, and the EPA generally has no authority to enforce such controls (EPA 2000a). An example of a government control active on the OU2 site is the requirement for MDT Encroachment Permits for intrusive work within the ROW to Highway 37.

### 3.2.2 Evaluate and Update Governmental Controls

Because land use and ownership changes can occur over a relatively short time, developers and other parties may not be fully aware of the ICs that have been put in place as part of a cleanup. Both the administrative/legal components of government controls as well as the physical evidence will be updated. Government controls will be evaluated during site inspections to identify any changes in land use, including evaluations of the activities conducted within Highway 37 ROW and the MDT Encroachment Permit.

## 3.3 Enforcement and Permit Tools

Enforcement and permit tools are legal tools, such as administrative orders, permits, Federal Facility Agreements (FFAs) and Consent Decrees (CDs), that limit certain site activities or require the performance of specific activities (e.g., to monitor and report on an IC's effectiveness) (EPA 2012b). The establishment of enforcement and permit tools is not anticipated at the time of the development of this O&M plan; therefore, the evaluation and updating of enforcement and permit tools is not addressed. However they may become a required type of IC for OU2 if other means of establishing ICs with affected property owners are unsuccessful.

## 3.4 Informational Devices

Informational devices provide information or notification to local communities that residual or contained contamination remains on site (EPA 2012b).

### 3.4.1 Establish Informational Devices

The EPA has recognized that an important IC at OU2 involves the agreement with the Montana one-call utility locate service, otherwise known as U-Dig. U-Dig is a local service that people call at no cost before digging at their property to locate underground utility hazards (e.g., electrical lines, waterlines). Utilizing the U-Dig system allows the EPA to provide information of "known areas of subsurface vermiculite at OU2" to anyone conducting work on the property (EPA 2010b).

U-Dig calls and requests for information are currently fielded by ERS personnel. The ERS position is considered an informational device used to convey information to the public and is currently staffed by EPA. The purpose of this position is to provide advice on how to address contamination. In addition to providing advice and instruction, the ERS manages any site contamination encountered. The ERS position may be transitioned to another government entity when RA across the site is complete. In addition, the EPA has recommended best management practices (BMPs) applicable to construction

contractors and tradesman working in Libby. More information on BMP's may be found on the EPA website (<http://www.epa.gov/region8/superfund/libby/docs/ci.html#tabs-2>) (EPA 2012c).

The EPA Libby Asbestos Superfund Site website (<http://www.epa.gov/region8/superfund/libby/>) is also a source for information about the Libby Asbestos Superfund Site (EPA 2011). The EPA currently manages the website, which provides a source for information to the public regarding current activities at the Libby Asbestos Superfund Site. Additional informational sources may be established and maintained including advertisements, handouts, and training classes.

### 3.4.2 Evaluate and Update Informational Devices

The effectiveness of websites and the U-Dig services will be evaluated and updated on an annual basis to improve accessibility, navigability, design, content, and technical functionality.

***This page left blank intentionally***

## Section 4

# Reporting Requirements

As described in Section 1.2.3, Five-Year Review Reports will be completed by the EPA on a five year cycle with the initial schedule presented in Table 1-1 and in accordance with *Comprehensive Five-Year Review Guidance* (EPA 2001b). Reports on O&M activities will be generated on a routine basis and as required by unforeseen events (described below). The EPA will review the reports on an ongoing basis.

### 4.1 Routine Reports

Routine reports summarizing O&M activities will be prepared and submitted to the remedial project manager (RPM) on an annual basis.

Routine reports will include sections on results from routine inspections, listing of major repairs, breakdown of actual costs for the reporting period, budget for the next reporting period, regular updates of the Site Safety and Health Plan, O&M Manual and as-built drawings, community complaints and responses, and verification of the integrity of ICs.

These reports will assist the EPA in considering the adequacy of O&M, the frequency of repairs, costs at the site, and how these factors relate to determining and ensuring protectiveness of the remedy.

### 4.2 Special Reports

Special reports are required as needed due to unforeseen events or conditions. One example of a special report is an incident report. Incident reports are used to document the details of accidents involving site personnel, and other unusual events such as fires, floods, or weather damage as may be required by the O&M HASP. Another example of a special report is a record of modification or amendment to the O&M HASP. When accidents occur on-site, the O&M HASP may need to be updated depending on the type of incident and whether or not it is already covered in the plan. These special reports should be made available to the EPA and other interested parties in a timely manner (EPA 2001a).

***This page left blank intentionally***



## Section 5

### Cost Estimate

As part of the O&M plan, costs are developed to estimate all the O&M activities as discussed in this report. The O&M cost estimate was primarily developed to provide EPA with a preliminary cost basis for establishing ICs, costs for routine and non-routine remedy maintenance, annual site inspections, and cost for Five-Year Reviews as described in this O&M plan report.

#### 5.1 Purpose and Intended Uses

This O&M cost estimate reflects the annual and periodic costs for implementing the long-term O&M at the OU2 site.

The intended use of the O&M cost estimate is to support EPA in the development and preparation of the annual O&M budget for the OU2 site. The O&M cost estimate is also used to help the EPA understand the costs associated with implementing the long-term O&M at OU2 of the Site.

#### 5.2 Methodology and Organization

The basis for the O&M cost estimate is the selected remedy cost estimate prepared in 2010 for the OU2 ROD. The selected remedy cost estimate was developed according to *A Guide to Developing and Documenting Cost Estimates during the Feasibility Study* (EPA 2000b).

The O&M cost estimate was prepared by using the same cost summary and cost worksheet templates used for the selected remedy cost estimate with following changes:

- The worksheets from the selected remedy estimate were modified to reflect the scope as presented in the OU2 O&M plan report.
- New worksheets were developed as necessary to reflect the major O&M components.
- The unit costs presented in the selected remedy cost estimate were escalated to the current (2012) dollars to reflect potential increases in cost due to inflation since 2009. Escalation indices from the yearly composite cost index (weighted average) from the U.S. Army Corps of Engineers (USACE) Civil Works Construction Cost Index System (CWCCIS), Engineering Manual (EM) 1110-2-1304, 31 March 2000, Revised as of 31 March 2012 was used.
- Labor rates was also updated using current wage reports from SalaryExpert.com and Davis-Bacon (General Decision Number: MT120001, 04/20/2012).
- Markup for RD cost was removed from the O&M estimate because RD/RA has already been completed by the EPA.
- Markup for contingency was reduced to 10% which includes 5% scope and 5% bid contingencies. The 10% bid contingency reflects the unknown costs associated with implementing the O&M; such as adverse weather conditions, materials costs, or unfavorable market conditions.

The O&M cost estimate consists of cost worksheets, a cost summary, and a present value analysis. The cost worksheets provide the costs for individual O&M components. The cost summary includes annual O&M costs and other periodic costs for the long-term O&M, it also includes contingencies, and professional/technical services costs (excluding RD costs). Present value analysis of the estimated O&M cost was also done. For this a period of 30-years was assumed, although the O&M will be conducted indefinitely throughout the life of the site.

Present value analysis is a method to evaluate expenditures, either capital or O&M, which occur over different time periods. The single cost figure, referred to as the present value, is the amount needed to be set aside at the initial point in time (base year) to assure that funds will be available in the future as they are needed, assuming certain economic conditions. Inflation was first applied to annual costs prior to the present value analysis. Inflation was based on the USACE CWCCIS yearly composite cost index (weighted average). Discount rate for present value analysis was based on the 10-year average of nominal 30-year treasury interest rates (Appendix C of Office of Management and Budget [OMB] Circular A-94, Revised 11/2011).

### 5.3 Cost Estimates Accuracy and Cost Uncertainty

The O&M cost estimate is developed to be as accurate as the current information allows and is based on the scope presented. The cost estimate is expected to have an accuracy of +50% to -30% of the actual costs. This cost accuracy range is consistent with EPA's Remedial Design/Remedial Action Handbook (EPA 1995) for preliminary development of O&M activities and responsibilities.. Currently this cost estimate is an *Opinion of Probable Cost* only, and further refinement of the cost estimate will be done after additional inputs are gained from the stakeholders.

The O&M cost estimate does not include costs associated with specific EPA contracting vehicles, like the response action contract (RAC). Typical costs include program management costs, general and administrative costs, subcontracting costs and fees.

### 5.4 O&M Cost Estimate

As stated above, this is a probable cost of O&M. The actual cost to EPA may be lower depending on whether cost efficiencies in implementing the O&M at OU2 of the Site can be found. Costs related to implementation of ICs are excluded from the O&M cost estimate.

The detailed cost estimate (cost worksheets, cost summary, and present value analysis) is presented in Appendix A of this O&M plan report. The following table presents the summary of the O&M cost estimates.

**Table 5-1**  
**Summary of Probable Operations and Maintenance Cost**

O&M Component	Cost Type	Description	Cost
Cover Maintenance (Minor Breaches)	Annual O&M Cost	Includes annual cost for O&M of the OU2 remedy. Breached that can be repaired without additional excavation of contaminated soils are considered as Minor Breaches. Refer Section 2.3 for details.	<b>\$8,000</b>
Routine Site Inspection	Annual O&M Cost	Includes annual site inspection to inspect the integrity of all the components of the remedy put in-place. It is assumed that annual O&M cost would be incurred annually from Year 2012. Refer Section 2 for details.	<b>\$2,000</b>
Evaluating and Updating Institutional Controls	Annual O&M Cost	The cost includes annual evaluation and update of the implemented institutional controls at the OU2 site. Refer Section 3 for details.	<b>\$2,000</b>
Cover Maintenance (Major Breaches)	Periodic O&M Cost	Includes periodic costs for repairing major breaches to the protective cover. It may include additional excavation of contaminated materials To secure the disturbed areas. Refer Section 2.3 for details.	<b>\$21,000</b>

**Note:**

1. Detailed costs and backup are presented in Appendix A.
2. Costs are rounded to the nearest \$1,000.
3. Costs based on 2012 prices.
4. Costs presented are expected to have accuracy between -30% to +50% of actual cost, based on the scope presented.

**Table 5-2**  
**Summary of Probable Operations and Maintenance Cost Incurred by EPA**

O&M Component	Cost Type	Description	Cost
Five-Year Site Review	Periodic Cost	It includes costs for site visit and a five-year site review report and also includes setting up a community meeting to inform the local community about the status of the OU2 site. It is assumed that the five-year review cycle would start during Year 2015.	<b>\$50,000</b>

**Note:**

1. Detailed costs and backup are presented in Appendix A.
2. Cost is rounded to the nearest \$1,000.
3. Costs based on 2012 prices.
4. Costs presented are expected to have an accuracy between -30% to +50% of actual costs, based on the scope presented.

***This page left blank intentionally***

## Section 6

### References

CDM Federal Programs Corporation (CDM Smith). 2012. *Final Remedial Action Report, Libby Asbestos Superfund Site, the Former Screening Plant and Surrounding Properties, Operable Unit 2*, Lincoln County, Montana. 20 April.

\_\_\_\_\_. 2010. *2010 Flyway Investigation, Technical Memorandum*. July 23.

EPA (U.S. Environmental Protection Agency). 2012a. *Fill Material Sampling Technical Memorandum, Libby Asbestos Site*. May.

\_\_\_\_\_. 2012b. *Interim Final Guidance: Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Superfund, Brownfields, Federal Facility, UST and RCRA Corrective Action Cleanups*. December.

\_\_\_\_\_. 2012c. *Libby Asbestos Website*. Available at <http://www.epa.gov/region8/superfund/libby/docs/ci.html#tabs-2>. Accessed on 06 June 2012.

\_\_\_\_\_. 2011. *Libby Asbestos Website*. Available at <http://www.epa.gov/region8/superfund/libby/>. Accessed on 01 February 2011.

\_\_\_\_\_. 2010. *Record of Decision for the Libby Asbestos Superfund Site, The Former Screening Plant and Surrounding Properties*, OU2, Libby, MT. May 2010.

\_\_\_\_\_. 2009. *Final Remedial Investigation Report, The Former Screening Plant and Surrounding Properties*, OU2, Libby, MT. May.

\_\_\_\_\_. 2003. *Five-Year Review Process in the Superfund Program*. OSWER Directive 9355.7-08FS. EPA/540-F-02-004. April

\_\_\_\_\_. 2001a. *Operation and Maintenance in the Superfund Program*. OSWER 9200.1-37FS. EPA/540/F-01/004. May.

\_\_\_\_\_. 2001b. *Comprehensive Five-Year Review Guidance*, OSWER Directive 9355.7-03B-P. June.

\_\_\_\_\_. 2000a. *Institutional Controls: A Site Managers Guide to Identifying, Evaluating, and Selecting Institutional Controls at Superfund and RCRA Corrective Action Clean-ups*. EPA/540-F-00-005. OSWER Directive 9355.0-74FS-P. September.

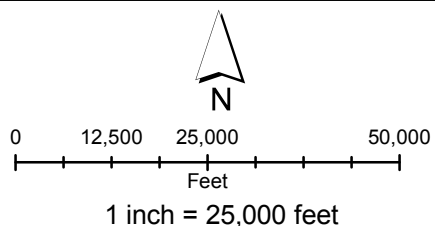
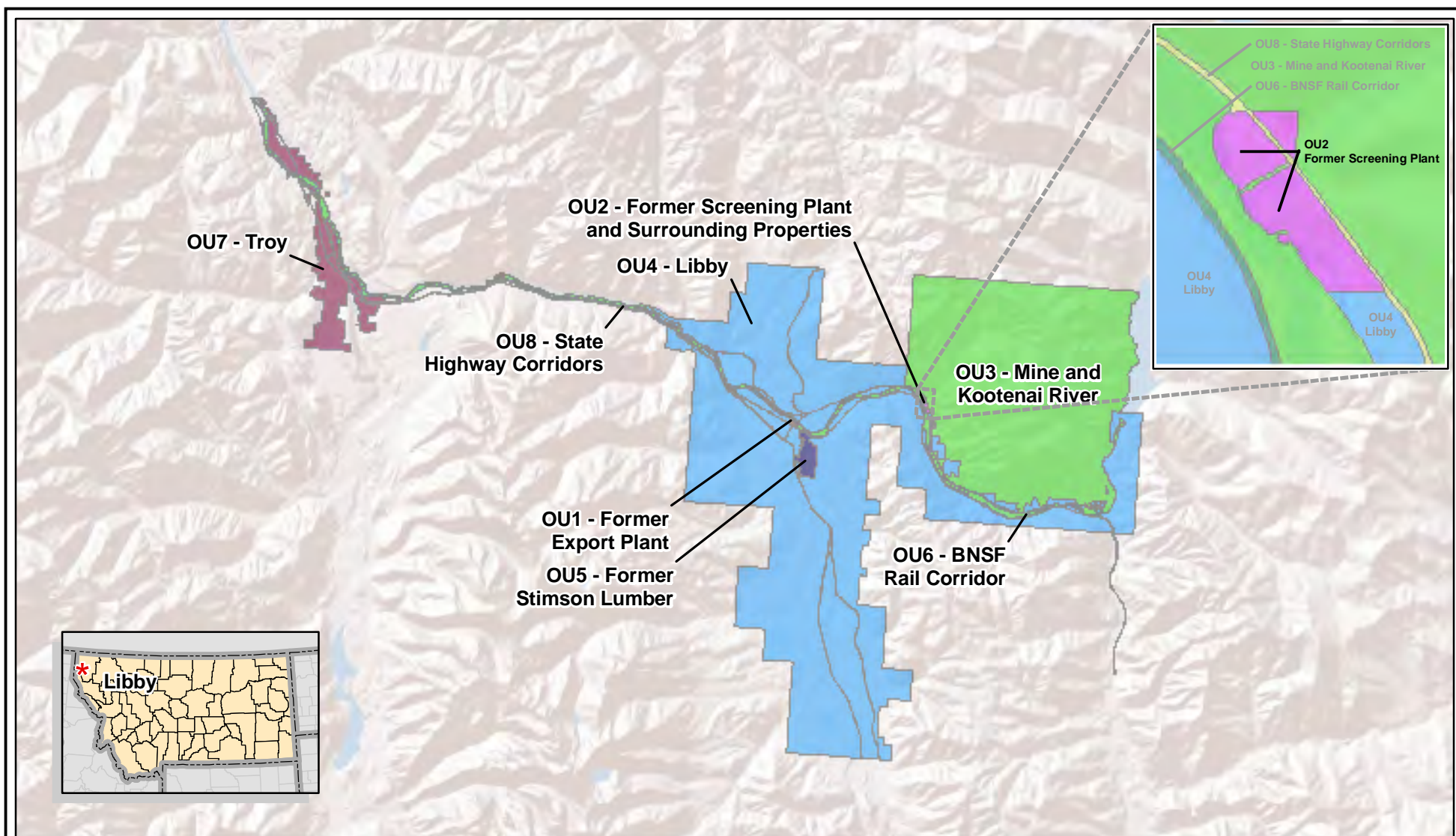
\_\_\_\_\_. 2000b. *A Guide to Developing and Documenting Cost Estimates during the Feasibility Study*. OSWER 9355.0-75. July.

\_\_\_\_\_. 1995. *Remedial Design/Remedial Action Handbook*. June.

\_\_\_\_\_. 1994. *National Oil and Hazardous Substance Pollution Contingency Plan*. September.

## Figures





### Legend









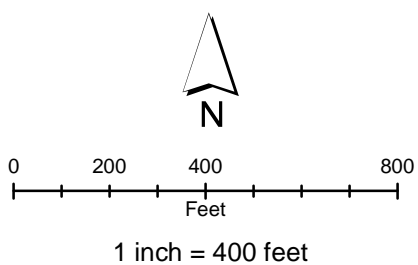
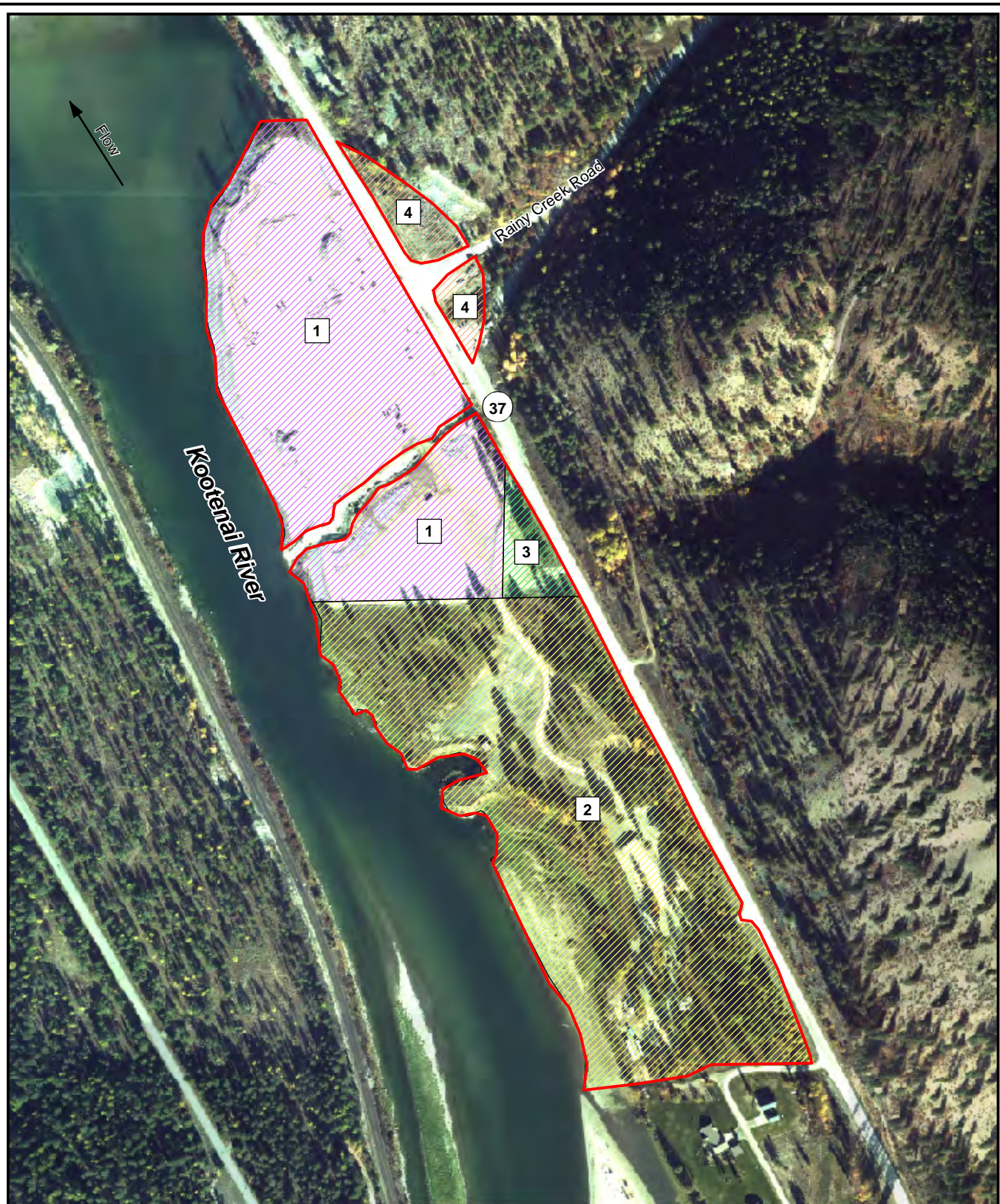
 OU1 - Former Export Plant	 OU5 - Former Stimson Lumber
 OU2 - Former Screening Plant	 OU6 - BNSF Rail Corridor
 OU3 - (Study Area) Mine and Kootenai River	 OU7 - Troy
 OU4 - Libby	 OU8 - State Highway Corridors

Figure 1-1  
Operable Units  
Libby Asbestos Superfund Site  
Lincoln County, Montana





#### Legend

- OU2 Boundary
- Subarea 1 - Former Screening Plant
- Subarea 2 - Flyway
- Subarea 3 - Private Property
- Subarea 4 - Rainy Creek Road Frontages

Figure 1-2  
OU2 Site Layout  
Libby Asbestos Superfund Site  
Lincoln County, Montana



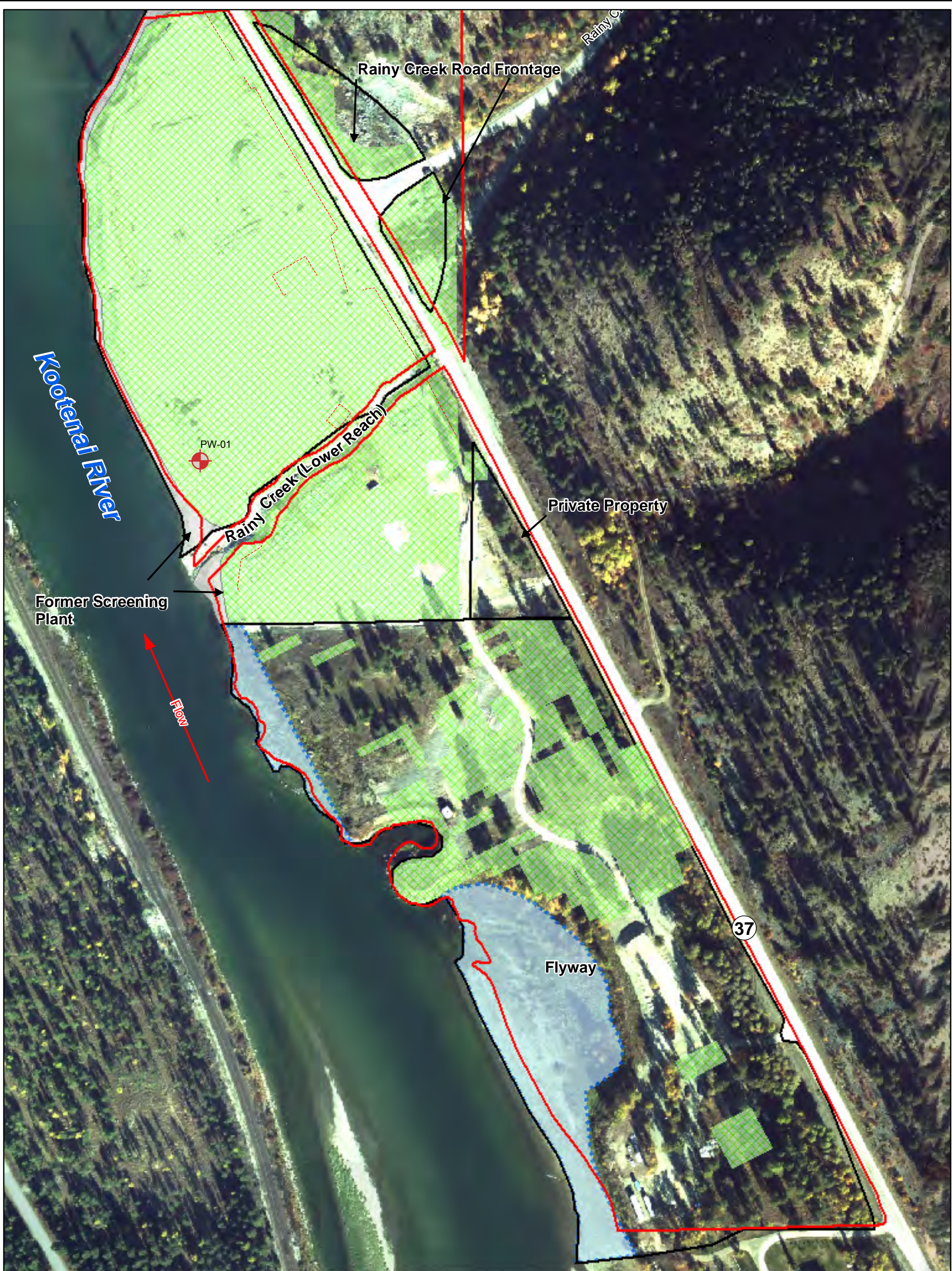
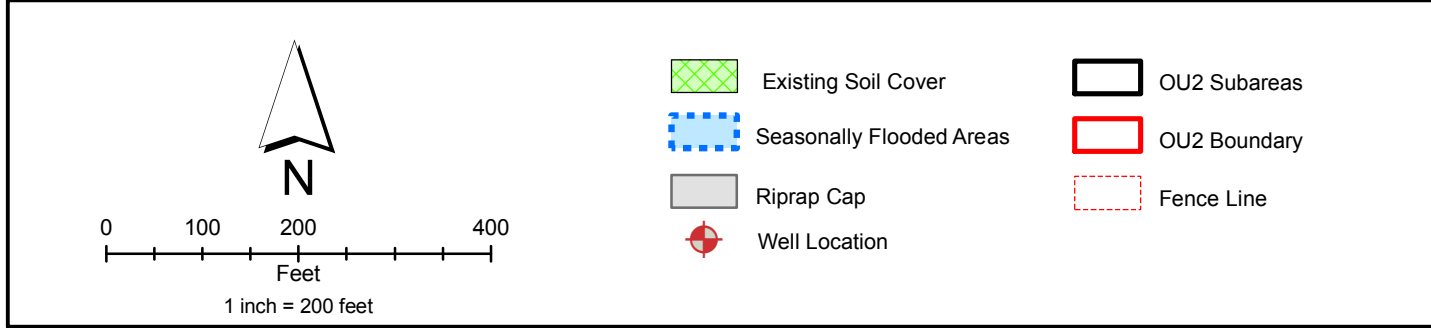
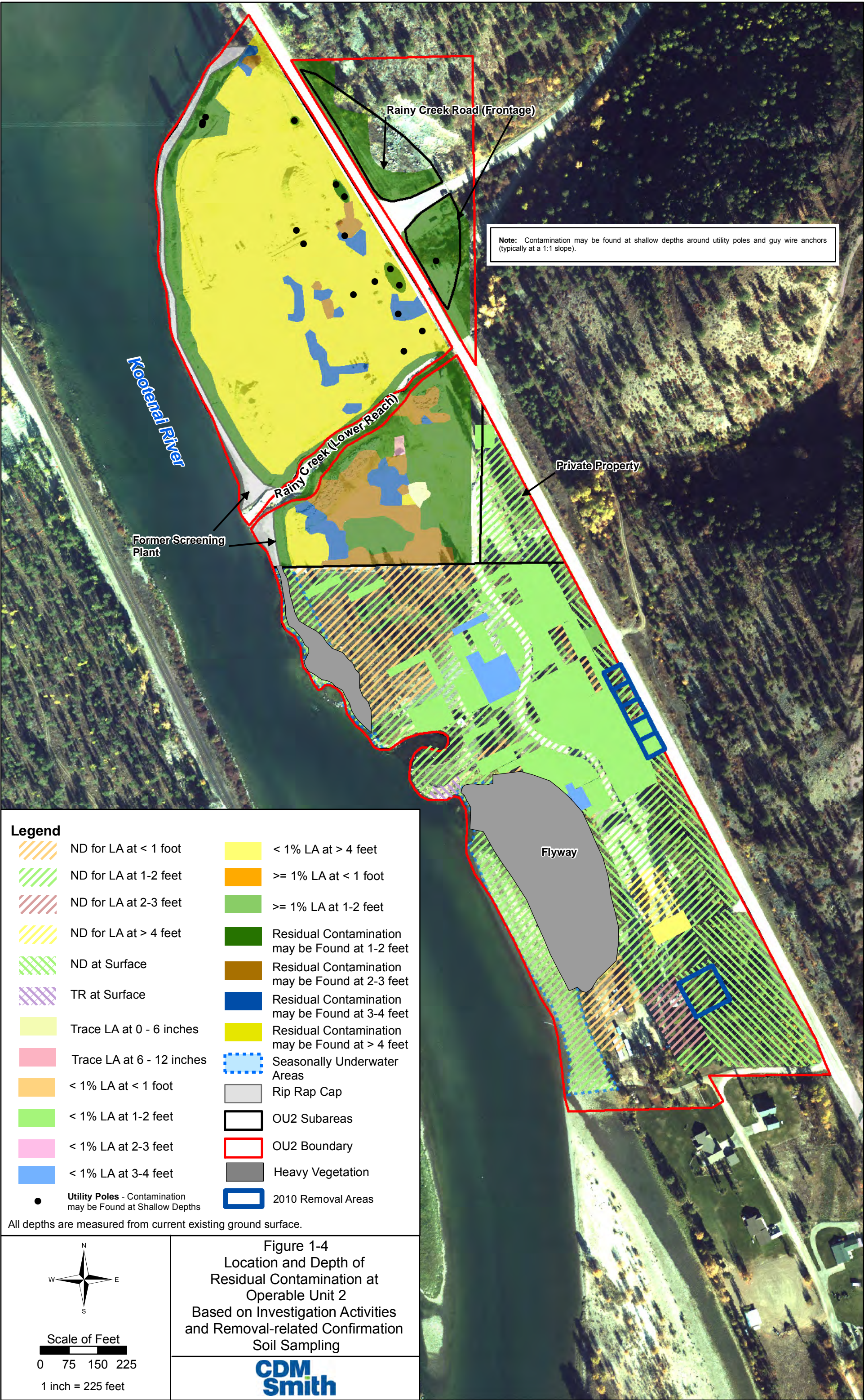


Figure 1-3  
 Location of Protective Covers  
 and  
 Remedy Components at OU2  
 Libby Asbestos Superfund Site  
 Lincoln County, Montana









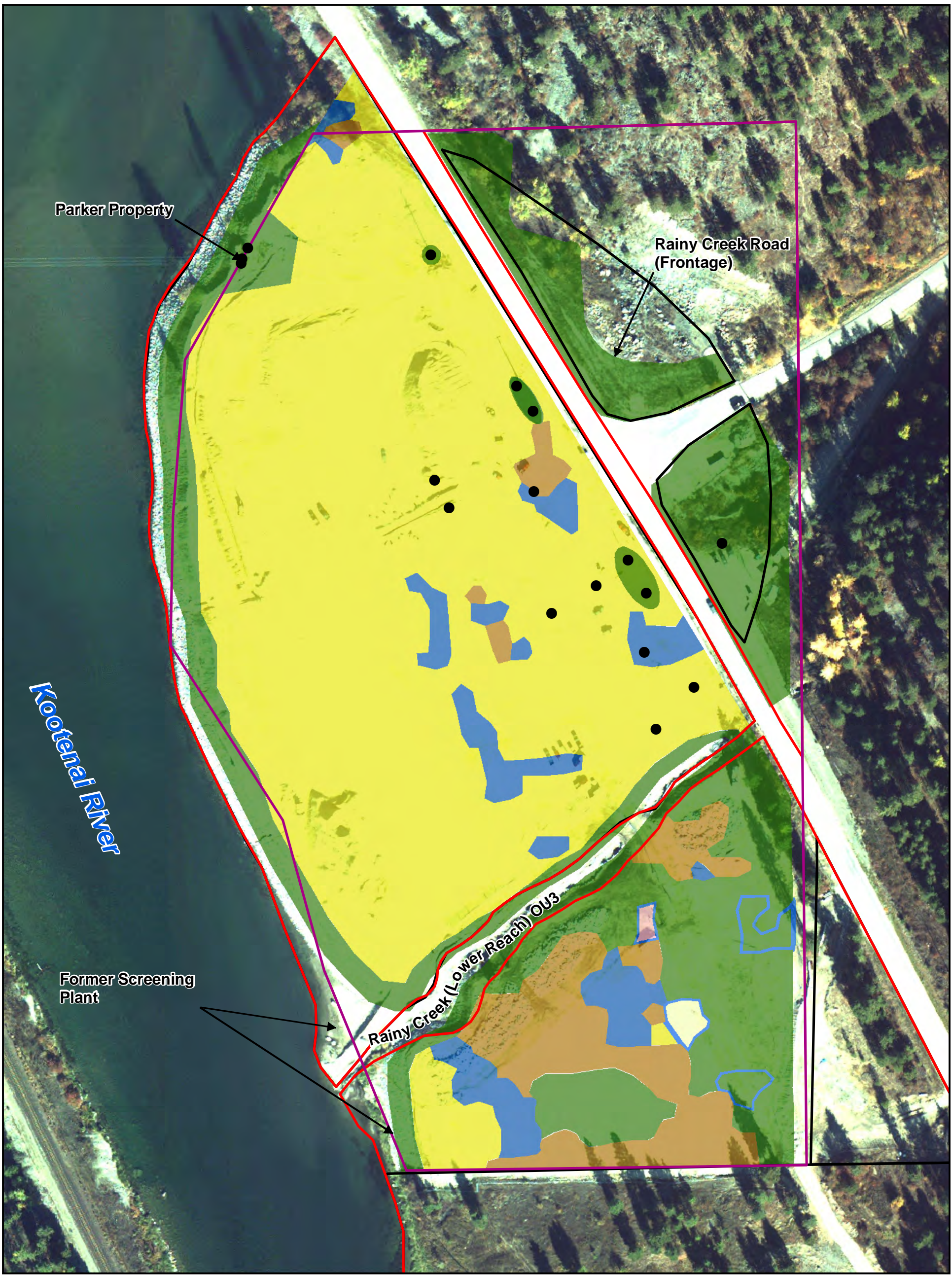
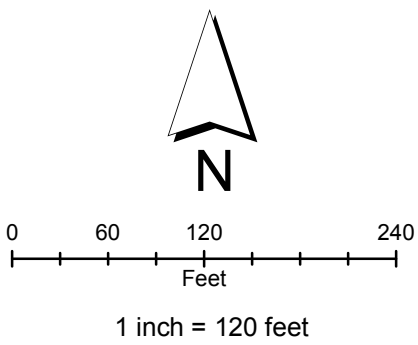


Figure 1-5  
Location and Depth of Residual Contamination  
at OU2 - Parker Property Based on  
Investigation Activities and Removal-related  
Confirmation Soil Sampling  
Libby Asbestos Superfund Site  
Lincoln County, Montana

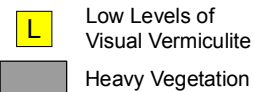
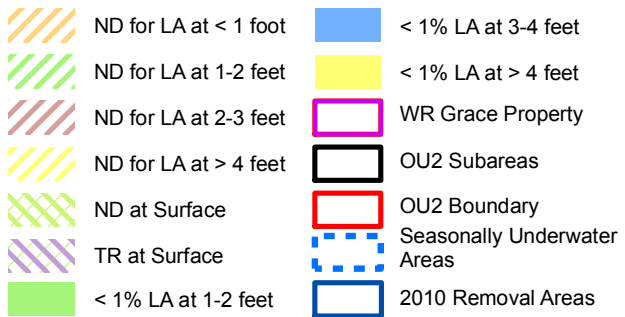
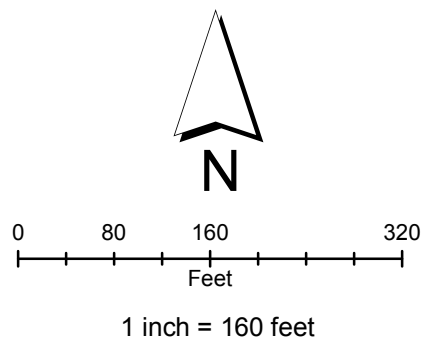


- |   |                                  |
|---|----------------------------------|
| Residual Contamination may be Found at 1-2 feet | Utility Pole                     |
| Residual Contamination may be Found at 2-3 feet | Rip Rap Cap                      |
| Residual Contamination may be Found at 3-4 feet | OU2 Subareas                     |
| Residual Contamination may be Found at > 4 feet | OU2 Boundary                     |
| TR LA at 0-6 inches                             | Parker Property                  |
| TR LA at 6-12 inches                            | November 2010 Investigation Area |





Figure 1-6  
Location and Depth of Residual Contamination  
at OU2 - WR Grace Property Based on  
Investigation Activities and Removal-related  
Confirmation Soil Sampling  
Libby Asbestos Superfund Site  
Lincoln County, Montana





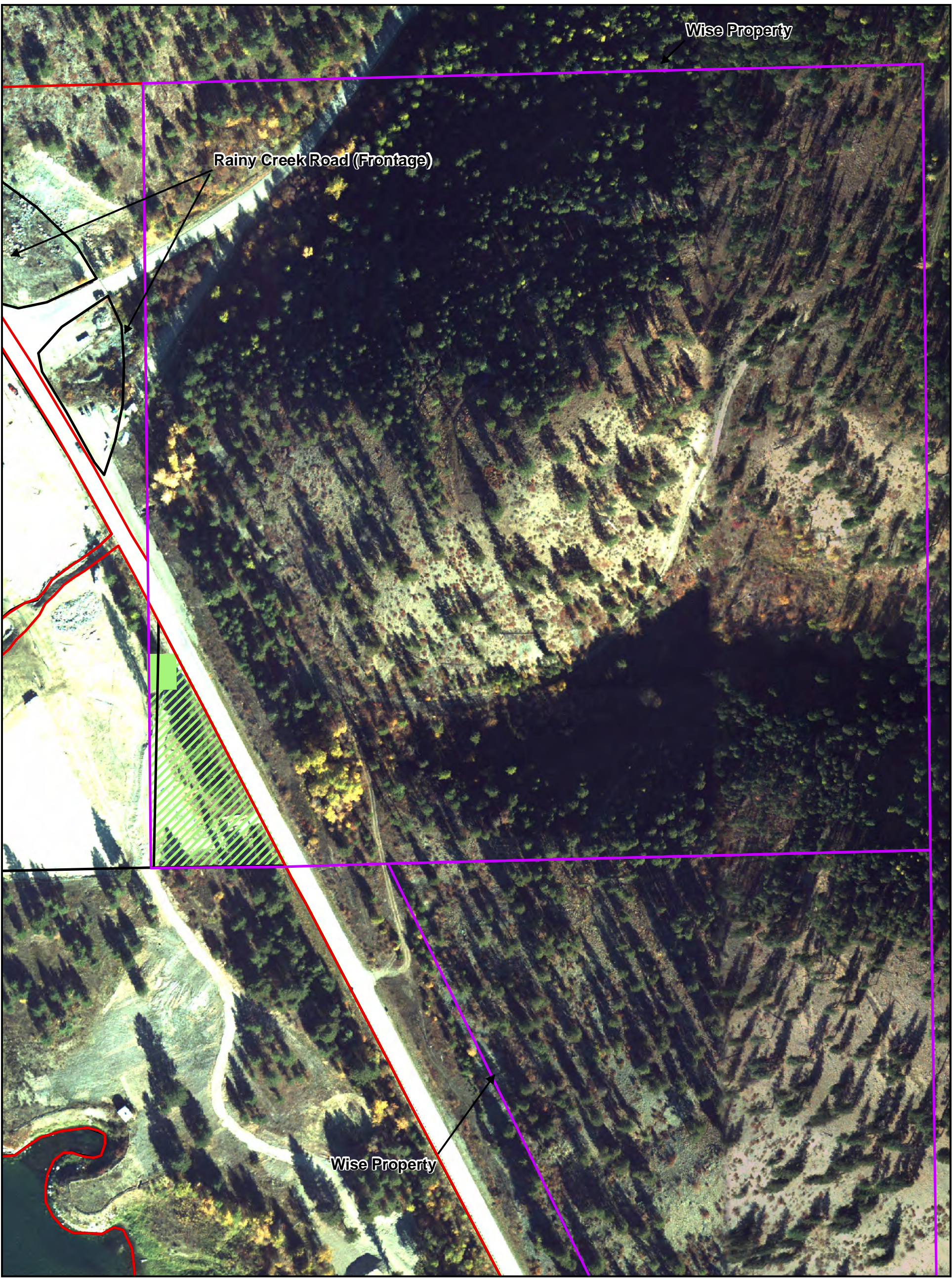


Figure 1-7  
Location and Depth of Residual Contamination  
at OU2 - Wise Property Based on  
Investigation Activities and Removal-related  
Confirmation Soil Sampling  
Libby Asbestos Superfund Site  
Lincoln County, Montana



## Appendix A

### Detailed O&M Cost Estimate

## **Present Value Analysis**

TABLE PV-O&amp;M

## PRESENT VALUE ANALYSIS

## Opinion of Probable Cost

## O&amp;M Cost Estimate

Site: OU2 - Former Screening Plant and Surrounding Properties

Location: Lincoln County, Montana

Phase: Operations and Maintenance (O&amp;M)

Base Year: 2012

Calendar Year <sup>1</sup>	Annual O&M Costs (Routine Site Inspection)	Annual O&M Costs (Cover Maintenance- Minor Breaches)	Annual O&M Costs (Evaluating and Updating ICs)	Periodic O&M Costs (Cover Maintenance - Major Breaches)	Periodic Costs (Five- Year Site Reviews)	Total Annual Expenditure (Undiscounted) <sup>2</sup>	Escalation Factor	Escalated Cost <sup>3</sup>	Discount Factor (5.0%)	Present Value (Discounted) <sup>4</sup>
2011	\$0	\$0	\$0	\$0	\$0	\$0	1.0000	\$0	1.0000	\$0
2012	\$2,000	\$8,000	\$2,000	\$0	\$0	\$12,000	1.0263	\$12,315	0.9524	\$11,729
2013	\$2,000	\$8,000	\$2,000	\$0	\$0	\$12,000	1.0439	\$12,527	0.9070	\$11,362
2014	\$2,000	\$8,000	\$2,000	\$0	\$0	\$12,000	1.0606	\$12,728	0.8638	\$10,994
2015	\$2,000	\$8,000	\$2,000	\$0	\$50,000	\$62,000	1.0797	\$66,943	0.8227	\$55,074
2016	\$2,000	\$8,000	\$2,000	\$21,000	\$0	\$33,000	1.0992	\$36,272	0.7835	\$28,419
2017	\$2,000	\$8,000	\$2,000	\$0	\$0	\$12,000	1.1189	\$13,427	0.7462	\$10,019
2018	\$2,000	\$8,000	\$2,000	\$0	\$0	\$12,000	1.1391	\$13,669	0.7107	\$9,715
2019	\$2,000	\$8,000	\$2,000	\$0	\$0	\$12,000	1.1596	\$13,915	0.6768	\$9,418
2020	\$2,000	\$8,000	\$2,000	\$0	\$50,000	\$62,000	1.1805	\$73,188	0.6446	\$47,177
2021	\$2,000	\$8,000	\$2,000	\$21,000	\$0	\$33,000	1.2017	\$39,656	0.6139	\$24,345
2022	\$2,000	\$8,000	\$2,000	\$0	\$0	\$12,000	1.2233	\$14,680	0.5847	\$8,583
2023	\$2,000	\$8,000	\$2,000	\$0	\$0	\$12,000	1.2454	\$14,944	0.5568	\$8,321
2024	\$2,000	\$8,000	\$2,000	\$0	\$0	\$12,000	1.2678	\$15,213	0.5303	\$8,068
2025	\$2,000	\$8,000	\$2,000	\$0	\$50,000	\$62,000	1.2906	\$80,017	0.5051	\$40,417
2026	\$2,000	\$8,000	\$2,000	\$21,000	\$0	\$33,000	1.3138	\$43,356	0.4810	\$20,854
2027	\$2,000	\$8,000	\$2,000	\$0	\$0	\$12,000	1.3375	\$16,050	0.4581	\$7,352
2028	\$2,000	\$8,000	\$2,000	\$0	\$0	\$12,000	1.3615	\$16,339	0.4363	\$7,128
2029	\$2,000	\$8,000	\$2,000	\$0	\$0	\$12,000	1.3861	\$16,633	0.4155	\$6,911
2030	\$2,000	\$8,000	\$2,000	\$0	\$50,000	\$62,000	1.4110	\$87,483	0.3957	\$34,617
2031	\$2,000	\$8,000	\$2,000	\$21,000	\$0	\$33,000	1.4364	\$47,401	0.3769	\$17,866
2032	\$2,000	\$8,000	\$2,000	\$0	\$0	\$12,000	1.4623	\$17,547	0.3589	\$6,298
2033	\$2,000	\$8,000	\$2,000	\$0	\$0	\$12,000	1.4886	\$17,863	0.3418	\$6,106
2034	\$2,000	\$8,000	\$2,000	\$0	\$0	\$12,000	1.5154	\$18,184	0.3256	\$5,921
2035	\$2,000	\$8,000	\$2,000	\$0	\$50,000	\$62,000	1.5426	\$95,644	0.3101	\$29,659
2036	\$2,000	\$8,000	\$2,000	\$21,000	\$0	\$33,000	1.5704	\$51,824	0.2953	\$15,304
2037	\$2,000	\$8,000	\$2,000	\$0	\$0	\$12,000	1.5987	\$19,184	0.2812	\$5,395
2038	\$2,000	\$8,000	\$2,000	\$0	\$0	\$12,000	1.6275	\$19,530	0.2678	\$5,230
2039	\$2,000	\$8,000	\$2,000	\$0	\$0	\$12,000	1.6568	\$19,881	0.2551	\$5,072
2040	\$2,000	\$8,000	\$2,000	\$0	\$50,000	\$62,000	1.6866	\$104,568	0.2429	\$25,399
2041	\$2,000	\$8,000	\$2,000	\$21,000	\$0	\$33,000	1.7169	\$56,659	0.2314	\$13,111
<b>TOTALS:</b>	\$60,000	\$240,000	\$60,000	\$126,000	\$300,000	\$786,000		\$1,067,640		\$495,864
<b>OPINION OF PROBABLE COST FOR O&amp;M<sup>5</sup></b>						<b>\$786,000</b>		<b>\$1,068,000</b>		<b>\$496,000</b>

## Notes:

For cost estimating purposes, O&amp;M costs are presented for a 30-year period after determination of O&amp;F.

However O&amp;M activities are assumed to be required for an indefinite period since OU2 involves a containment remedy.

Costs presented are expected to have an accuracy between +50% to -30% of actual costs based on the scope presented.

This cost accuracy range is consistent with EPA's Remedial Design/Remedial Action Handbook (EPA 1995) for preliminary development of O&amp;M activities and responsibilities.

<sup>1</sup> Duration is assumed to be 30 years for present value analysis.<sup>2</sup> Total annual expenditure is the total cost per year with no escalation or discounting.<sup>3</sup> Escalation cost is the total cost per year including an escalation rate for that year. See Table PV-AERFT for details.<sup>4</sup> Present value is the total cost per year including a 5.0% discount factor for that year. See Table PV-ADRFT for details.<sup>5</sup> Total cost is rounded to the nearest \$1,000. Depreciation is excluded from the present value cost.



## TABLE PV-AERFT

### ANNUAL ESCALATION RATE FACTORS TABLE

**Site:** OU2 - Former Screening Plant and Surrounding Properties

**Location:** Lincoln County, Montana

**Phase:** Operations and Maintenance (O&M)

**Base Year:** 2012

Year		Cost Index <sup>1</sup>	Escalation Factor	Year		Cost Index <sup>1</sup>	Escalation Factor
0	2011	756.48	1.0000	26	2037	1209.37	1.5987
1	2012	776.35	1.0263	27	2038	1231.14	1.6275
2	2013	789.71	1.0439	28	2039	1253.30	1.6568
3	2014	802.35	1.0606	29	2040	1275.86	1.6866
4	2015	816.79	1.0797	30	2041	1298.83	1.7169
5	2016	831.49	1.0992				
6	2017	846.46	1.1189				
7	2018	861.69	1.1391				
8	2019	877.20	1.1596				
9	2020	892.99	1.1805				
10	2021	909.07	1.2017				
11	2022	925.43	1.2233				
12	2023	942.09	1.2454				
13	2024	959.05	1.2678				
14	2025	976.31	1.2906				
15	2026	993.88	1.3138				
16	2027	1011.77	1.3375				
17	2028	1029.98	1.3615				
18	2029	1048.52	1.3861				
19	2030	1067.40	1.4110				
20	2031	1086.61	1.4364				
21	2032	1106.17	1.4623				
22	2033	1126.08	1.4886				
23	2034	1146.35	1.5154				
24	2035	1166.98	1.5426				
25	2036	1187.99	1.5704				

**Notes:**

<sup>1</sup> Yearly composite cost index (weighted average) from the U.S. Army Corps of Engineers Civil Works Construction Cost Index System (CWCCIS), EM 1110-2-1304, 31 March 2000. Revised as of 31 March 2012.

**TABLE PV-ADRFT**

# ANNUAL DISCOUNT RATE FACTOR TABLE

**Site:** OU2 - Former Screening Plant and Surrounding Properties

**Location:** Lincoln County, Montana

**Phase:** Operations and Maintenance (O&M)

**Base Year:** 2012

**Discount Rate (Percent):** 5.00% 10-year average of 30-year rates

Year	Discount Factor <sup>1,2</sup>	Year	Discount Factor <sup>1,2</sup>
0	1.0000	26	0.2812
1	0.9524	27	0.2678
2	0.9070	28	0.2551
3	0.8638	29	0.2429
4	0.8227	30	0.2314
5	0.7835		
6	0.7462		
7	0.7107		
8	0.6768		
9	0.6446		
10	0.6139		
11	0.5847		
12	0.5568		
13	0.5303		
14	0.5051		
15	0.4810		
16	0.4581		
17	0.4363		
18	0.4155		
19	0.3957		
20	0.3769		
21	0.3589		
22	0.3418		
23	0.3256		
24	0.3101		
25	0.2953		

**Notes:**

<sup>1</sup> Annual discount factors were calculated using the formulas and guidance presented in Section 4.0 of Guide to Developing and Documenting Cost Estimates During the Feasibility Study, EPA 2000.

<sup>2</sup> The net present value will not be calculated with the real discount rate as recommended by EPA's Guide to Developing and Documenting Cost Estimates during the Feasibility Study; rather an inflation rate of 3 percent and a nominal discount (interest) rate of 5 percent (typical of city bonds) was applied separately in the determination of net present value.

**TABLE PV-OMB**

**OMB NOMINAL TREASURY INTEREST RATES**

**Site:** OU2 - Former Screening Plant and Surrounding Properties  
**Location:** Lincoln County, Montana  
**Phase:** Operations and Maintenance (O&M)  
**Base Year:** 2012

Year	3-Year	5-Year	7-Year	10-Year	20-Year	30-Year
1992	6.1%	6.5%	6.7%	7.0%	N/A	7.1%
1993	5.6%	6.0%	6.3%	6.7%	N/A	6.8%
1994	5.0%	5.3%	5.5%	5.7%	N/A	5.8%
1995	7.3%	7.6%	7.7%	7.9%	N/A	8.1%
1996	5.4%	5.5%	5.5%	5.6%	N/A	5.7%
1997	5.8%	5.9%	6.0%	6.1%	N/A	6.3%
1998	5.6%	5.7%	5.8%	5.9%	N/A	6.1%
1999	4.7%	4.8%	4.9%	4.9%	N/A	5.0%
2000	5.9%	6.0%	6.0%	6.1%	N/A	6.3%
2001	5.4%	5.4%	5.4%	5.4%	N/A	5.3%
2002	4.1%	4.5%	4.8%	5.1%	N/A	5.8%
2003	3.1%	3.6%	3.9%	4.2%	N/A	5.1%
2004	3.0%	3.7%	4.2%	4.6%	5.4%	5.5%
2005	3.7%	4.1%	4.4%	4.6%	5.2%	5.2%
2006	4.7%	4.8%	4.9%	5.0%	5.3%	5.2%
2007	4.9%	4.9%	4.9%	5.0%	5.1%	5.1%
2008	4.1%	4.3%	4.4%	4.6%	4.9%	4.9%
2009	2.7%	3.3%	3.7%	4.2%	4.7%	4.5%
2010	2.3%	3.1%	3.5%	3.9%	4.4%	4.5%
2011	1.4%	1.9%	2.4%	3.0%	3.9%	4.2%
2012	1.6%	2.1%	2.5%	2.8%	3.5%	3.8%
<b>20-year Ave.</b>	<b>5.00%</b>	<b>5.00%</b>	<b>5.00%</b>	<b>7.50%</b>	<b>5.00%</b>	<b>7.50%</b>
<b>10-year Ave.</b>	<b>3.25%</b>	<b>3.75%</b>	<b>4.00%</b>	<b>4.50%</b>	<b>4.75%</b>	<b>5.00%</b>

**Notes:**

- Nominal Treasury interest rates were taken from the annual budget assumptions for the first year of the budget forecast
- Averages rounded to nearest quarter of a percent
- N/A - No data is available prior to 2004 for the 20-year interest rate.

## **Cost Estimate Summary**

TABLE CS-O&amp;M

## COST ESTIMATE SUMMARY

## Opinion of Probable Cost

## O&amp;M Cost Estimate

**Site:** OU2 - Former Screening Plant and Surrounding Properties  
**Location:** Lincoln County, Montana  
**Phase:** Operations and Maintenance (O&M)  
**Base Year:** 2012  
**Date:** June-2012

## ANNUAL OPERATIONS AND MAINTENANCE (O&amp;M) COSTS

## COVER MAINTENANCE (MINOR BREACHES) (Calendar Years 2012 through 2041)

DESCRIPTION	WORKSHEET	QUANTITY	UNIT(S)	UNIT COST	TOTAL	NOTES
Mobilization/Demobilization for Repair of Minor Breaches	CWOM-7A	1	EA	\$696	\$696	
Annual Cover Maintenance - Minor Breaches	CWOM-3	1	LS	\$5,271	\$5,271	Includes labor for cover, and remedy maintenance
SUBTOTAL					\$5,967	
Contingency (Scope and Bid)		10%			\$597	5% Scope, 5% Bid (Low end of recommended range in EPA 540-R-00-002).
SUBTOTAL					\$6,564	
Project Management		10%			\$656	Percentage from Exhibit 5-8 in EPA 540-R-00-002 was used.
Technical Support		15%			\$985	Middle value of the recommended range in EPA 540-R-00-002 was used.
TOTAL					\$8,205	
<b>TOTAL ANNUAL O&amp;M COST</b>					<b>\$8,000</b>	Total O&M cost is rounded to the nearest \$1,000.

## ANNUAL OPERATIONS AND MAINTENANCE (O&amp;M) COSTS

## ROUTINE SITE INSPECTION (Calendar Years 2012 through 2041)

DESCRIPTION	WORKSHEET	QUANTITY	UNIT(S)	UNIT COST	TOTAL	NOTES
Annual Site Inspection	CWOM-4	1	LS	\$1,495	\$1,495	Includes annual site inspection
SUBTOTAL					\$1,495	
Contingency (Scope and Bid)		10%			\$150	5% Scope, 5% Bid (Low end of recommended range in EPA 540-R-00-002).
SUBTOTAL					\$1,645	
Project Management		10%			\$165	Percentage from Exhibit 5-8 in EPA 540-R-00-002 was used.
Technical Support		15%			\$247	Middle value of the recommended range in EPA 540-R-00-002 was used.
TOTAL					\$2,057	
<b>TOTAL ANNUAL O&amp;M COST</b>					<b>\$2,000</b>	Total O&M cost is rounded to the nearest \$1,000.

## ANNUAL OPERATIONS AND MAINTENANCE (O&amp;M) COSTS

## EVALUATING AND UPDATING INSTITUTIONAL CONTROLS (Calendar Years 2012 through 2041)

DESCRIPTION	WORKSHEET	QUANTITY	UNIT(S)	UNIT COST	TOTAL	NOTES
Evaluating and Updating Institutional Controls	CWOM-1	1	LS	\$1,729	\$1,729	
SUBTOTAL					\$1,729	
Contingency (Scope and Bid)		10%			\$173	5% Scope, 5% Bid (Low end of recommended range in EPA 540-R-00-002).
SUBTOTAL					\$1,902	
Project Management		10%			\$190	Percentage from Exhibit 5-8 in EPA 540-R-00-002 was used.
Technical Support		15%			\$285	Middle value of the recommended range in EPA 540-R-00-002 was used.
TOTAL					\$2,377	
<b>TOTAL ANNUAL O&amp;M COST</b>					<b>\$2,000</b>	Total O&M cost is rounded to the nearest \$1,000.

TABLE CS-O&amp;M

## COST ESTIMATE SUMMARY

## Opinion of Probable Cost

## O&amp;M Cost Estimate

**Site:** OU2 - Former Screening Plant and Surrounding Properties  
**Location:** Lincoln County, Montana  
**Phase:** Operations and Maintenance (O&M)  
**Base Year:** 2012  
**Date:** June-2012

## PERIODIC COSTS

## COVER MAINTENANCE (MAJOR BREACHES) (Assumed to be Incurred During Calendar Years 2016, 2021, 2026, 2031, 2036, and 2041)

DESCRIPTION	WORKSHEET	QUANTITY	UNIT(S)	UNIT COST	TOTAL	NOTES
Mobilization/Demobilization for Repair of Major Breaches	CWOM-7B	1	EA	\$4,142	\$4,142	
Contaminated Soil Excavation and Disposal - Major Breaches	CWOM-5B	1	LS	\$2,566	\$2,566	
Borrow Material Sampling	CWOM-8	1	LS	\$1,974	\$1,974	
Cover Maintenance - Major Breaches	CWOM-5A	1	LS	\$2,782	\$2,782	
Periodic Hydroseeding of Soil Cover - Major Breaches	CWOM-6	1	LS	\$2,153	\$2,153	
SUBTOTAL					\$13,617	
Contingency (Scope and Bid)		10%			\$1,362	5% Scope, 5% Bid (Low end of recommended range in EPA 540-R-00-002).
SUBTOTAL					\$14,979	
Project Management		10%			\$1,498	Percentage from Exhibit 5-8 in EPA 540-R-00-002 was used.
Construction Management		15%			\$2,247	Percentage from Exhibit 5-8 in EPA 540-R-00-002 was used.
Technical Support		15%			\$2,247	Middle value of the recommended range in EPA 540-R-00-002 was used.
TOTAL					\$20,971	
<b>TOTAL CAPITAL COST</b>					<b>\$21,000</b>	Total capital cost is rounded to the nearest \$1,000.

## PERIODIC COSTS

## FIVE-YEAR SITE REVIEW (Calendar Years 2015, 2020, 2025, 2030, 2035, and 2040)

DESCRIPTION	WORKSHEET	QUANTITY	UNIT(S)	UNIT COST	TOTAL	NOTES
Five-Year Site Reviews	CWOM-2	1	LS	\$29,810	\$29,810	Includes site inspection and 5-year review report
Community Awareness Activities During Five-Year Review	CWOM-9	1	LS	\$6,698	\$6,698	Includes public notification and meetings associated with 5-year site review
SUBTOTAL					\$36,508	
Contingency (Scope and Bid)		10%			\$3,651	5% Scope, 5% Bid (Low end of recommended range in EPA 540-R-00-002).
SUBTOTAL					\$40,159	
Project Management		10%			\$4,016	The high end of the recommended range in EPA 540-R-00-002 was used.
Technical Support		15%			\$6,024	Middle value of the recommended range in EPA 540-R-00-002 was used.
TOTAL					\$50,199	
<b>TOTAL PERIODIC COST</b>					<b>\$50,000</b>	Total capital cost is rounded to the nearest \$1,000.

## Notes:

**For cost estimating purposes, O&M costs are presented for a 30-year period after determination of O&F. However O&M activities are assumed to be required for an indefinite period since OU2 involves a containment remedy.**

Costs presented are expected to have an accuracy between +50% to -30% of actual costs based on the scope presented.

This cost accuracy range is consistent with EPA's Remedial Design/Remedial Action Handbook (EPA 1995) for preliminary development of O&M activities and responsibilities.

Percentages used for contingency and professional/technical services costs are based on guidance from Section 5.0 of "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", EPA 540-R-00-002 (July 2000).

## Abbreviations:

EA Each  
 LS Lump Sum

## **Cost Worksheets**

TABLE CWOM-1

**OU2 Operations and Maintenance (O&M) Cost Worksheet: CWOM-1**  
**Capital Cost Sub-Element**  
**Evaluating and Updating Institutional Controls**

**COST WORKSHEET**

**Site:** OU2 - Former Screening Plant and Surrounding Pr  
**Location:** Lincoln County, Montana  
**Phase:** Operations and Maintenance (O&M)  
**Base Year:** 2012

**Prepared By:** AS **Date:** 1/27/2011

**Checked By:** GH **Date:** 2/2/2011

**Work Statement:**

This sub-element involves annual evaluation and update of the implemented institutional controls at the site. The following cost includes labor and materials to revise legal documents for institutional controls and cost for document submission and recording.

**Cost Analysis:**

Cost for Evaluating and Updating Institutional Controls (Lump Sum)

COST DATABASE CODE	DESCRIPTION	QTY	UNIT(S)	HPF	LABOR	ADJ LABOR	EQUIP	ADJ EQUIP	MATL	OTHER	UNMOD UC	UNMOD LIC	PC OH	PC PF	BUR LIC	COST SOURCE CITATION	COMMENTS
L6	Environmental Lawyer	4	HR	1.00	\$47.46	\$47.46	\$0.00	\$0.00	\$0.00	\$0.00	\$47.46	\$189.84	100%	9%	\$414	SE SalaryExpert.com	
L15	Paralegal	8	HR	1.00	\$36.24	\$36.24	\$0.00	\$0.00	\$0.00	\$0.00	\$36.24	\$289.92	100%	9%	\$632	SE SalaryExpert.com	
L3	Clerks, Typist, Bookkeeper & Receptionist	4	HR	1.00	\$19.31	\$19.31	\$0.00	\$0.00	\$0.00	\$0.00	\$19.31	\$77.24	100%	9%	\$168	SE SalaryExpert.com	
M11B	Document Submission and Recording Allowance	1	LS	1.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$515.00	\$515.00	\$515.00	0%	0%	\$515	A Allowance	
<b>TOTAL UNIT COST:</b>															\$1,729		

**Notes:**

HTRW productivity factor is from Exhibit B-3 or B-4 of "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", EPA 2000

The Cost Database Code is a reference code for linking with line item cost information with the cost source database and is not otherwise used within these cost worksheets.

**Source of Cost Data:**

NA Not Applicable - costs are from previous work or vendor quote

For citation references, the following sources apply:

MII (MII Assemblies), GSA (www.gsa.gov), SE (www.salaryexpert.com), A (Allowance), V (Vendor Quote), CW (Means CostWorks 2010), P (Previous Work), and FRTR (www.frtr.gov)

**Cost Adjustment Checklist:**

**FACTOR:**  
H&S Productivity (labor and equipment only)  
Escalation to Base Year  
Area Cost Factor  
Subcontractor Overhead and Profit  
Prime Contractor Overhead and Profit

**NOTES:**

Field work will be in Level "D" PPE.

MII assembly costs include HPF adjustments.

All other costs are escalated based on the USACE CWCCIS, EM 1110-2-1304, Sep 2010.

An AF of 0.96 is used for Montana, except that an AF of 1.00 (national unmodified average) is used for MII assembly costs and local vendor quotes.

It is assumed that Subcontractor O&P is either included in the PC O&P or has been factored into vendor quotes or previous work.

It is assumed that home office OH is 8% and profit is 9% for the Prime Contractor. Professional labor overhead is 100%. Allowances and items with mandated costs such as per diem do not have overhead and profit applied.

**Abbreviations:**

QTY	Quantity	ACR	Acres
EQUIP	Equipment	BCY	Bank Cubic Yard
MATL	Material	CLF	100 Linear Foot
HPF	HTRW Productivity Factor	DY	Days
ADJ LABOR	Adjusted Labor for HFP	EA	Each
ADJ EQUIP	Adjusted Equipment for HFP	LF	Linear Foot
UNMOD UC	Unmodified Unit Cost	HR	Hours
UNMOD LIC	Unmodified Line Item Cost	LB	Pounds
UNBUR LIC	Unburdened Line Item Cost	LCY	Loose Cubic Yard
PC OH	Prime Contractor Overhead	LS	Lump Sum
PC PF	Prime Contractor Profit	RL	Roll
BUR LIC	Burdened Line Item Cost	SY	Square Yard
		TN	Tons



TABLE CWOM-2

**OU2 Operation and Maintenance (O&M)  
Capital Cost Sub-Element  
Five-Year Site Reviews**

Cost Worksheet: CWOM-2

**COST WORKSHEET****Site:** OU2 - Former Screening Plant and Surrounding Properties**Prepared By:** AS**Date:** 6/6/2012**Location:** Lincoln County, Montana**Checked By:** MS**Date:** 6/7/2012**Phase:** Operations and Maintenance (O&M)**Base Year:** 2012**Work Statement:**

This sub-element involves the site visit and 5-year site review report. The following cost includes labor, material and shipping costs for site visits and 5-year site review reports.

**Cost Analysis:**

Cost for 5-Year Site Review (Lump Sum)

COST DATABASE CODE	DESCRIPTION	QTY	UNIT(S)	HPF	LABOR	ADJ LABOR	EQUIP	ADJ EQUIP	MATL	OTHER	UNMOD UC	UNMOD LIC	PC OH	PC PF	BUR LIC	COST SOURCE CITATION	COMMENTS
A6C	Site Inspection - 1 Person Crew	1	DY	1.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$395.12	\$395.12	\$395.12	8%	9%	\$465	MIll MIll Assemblies	
M57	Per Diem for 1 Person	1	DY	1.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$126.69	\$126.69	\$126.69	0%	0%	\$127	GSA www.gsa.gov	
L13	Project Manager	40	HR	1.00	\$58.90	\$58.90	\$0.00	\$0.00	\$0.00	\$0.00	\$58.90	\$2,356.00	100%	9%	\$5,136	SE SalaryExpert.com	Hours for 5-year review report
L5	Environmental Engineer	80	HR	1.00	\$38.85	\$38.85	\$0.00	\$0.00	\$0.00	\$0.00	\$38.85	\$3,108.00	100%	9%	\$6,775	SE SalaryExpert.com	Hours for 5-year review report
L7	Environmental Scientist	120	HR	1.00	\$39.14	\$39.14	\$0.00	\$0.00	\$0.00	\$0.00	\$39.14	\$4,696.80	100%	9%	\$10,239	SE SalaryExpert.com	Hours for 5-year review report
L14	Quality Control Engineer	16	HR	1.00	\$40.84	\$40.84	\$0.00	\$0.00	\$0.00	\$0.00	\$40.84	\$653.44	100%	9%	\$1,424	SE SalaryExpert.com	Hours for 5-year review report
L1	CAD Drafter	40	HR	1.00	\$27.69	\$27.69	\$0.00	\$0.00	\$0.00	\$0.00	\$27.69	\$1,107.60	100%	9%	\$2,415	SE SalaryExpert.com	Hours for 5-year review report
L3	Clerks, Typist, Bookkeeper & Receptionist	40	HR	1.00	\$19.31	\$19.31	\$0.00	\$0.00	\$0.00	\$0.00	\$19.31	\$772.40	100%	9%	\$1,684	SE SalaryExpert.com	Hours for 5-year review report
M10A	Copy and Shipping Allowance	1	LS	1.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$1,545.00	\$1,545.00	\$1,545.00	0%	0%	\$1,545	A Allowance	
<b>TOTAL UNIT COST:</b>															<b>\$29,810</b>		

**Notes:**

HTRW productivity factor is from Exhibit B-3 or B-4 of "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", EPA 2000

The Cost Database Code is a reference code for linking with line item cost information with the cost source database and is not otherwise used within these cost worksheets.

**Source of Cost Data:**

NA Not Applicable - costs are from previous work or vendor quote

For citation references, the following sources apply:

MIll (MIll Assemblies), GSA (www.gsa.gov), SE (www.salaryexpert.com), A (Allowance), V (Vendor Quote), CW (Means CostWorks 2010), P (Previous Work), and FRTR (www.frtr.gov)

**Cost Adjustment Checklist:**

FACTOR:

H&amp;S Productivity (labor and equipment only)

Escalation to Base Year

Area Cost Factor

Subcontractor Overhead and Profit

Prime Contractor Overhead and Profit

**NOTES:**

Field work will be in Level "D" PPE.

MIll assembly costs include HPF adjustments.

All other costs are escalated based on the USACE CWCCIS, EM 1110-2-1304, Sep 2010.

An AF of 0.96 is used for Montana, except that an AF of 1.00 (national unmodified average) is used for MIll assembly costs and local vendor quotes.

It is assumed that Subcontractor O&amp;P is either included in the PC O&amp;P or has been factored into vendor quotes or previous work.

It is assumed that home office OH is 8% and profit is 9% for the Prime Contractor. Professional labor overhead is 100%. Allowances and items with mandated costs such as per diem do not have overhead and profit applied.

**Abbreviations:**

QTY	Quantity	ACR	Acres
EQUIP	Equipment	BCY	Bank Cubic Yard
MATL	Material	CLF	100 Linear Foot
HPF	HTRW Productivity Factor	DY	Days
ADJ LABOR	Adjusted Labor for HFP	EA	Each
ADJ EQUIP	Adjusted Equipment for HFP	LF	Linear Foot
UNMOD UC	Unmodified Unit Cost	HR	Hours
UNMOD LIC	Unmodified Line Item Cost	LB	Pounds
UNBUR LIC	Unburdened Line Item Cost	LCY	Loose Cubic Yard
PC OH	Prime Contractor Overhead	LS	Lump Sum
PC PF	Prime Contractor Profit	RL	Roll
BUR LIC	Burdened Line Item Cost	SY	Square Yard
		TN	Tons

TABLE CWOM-3

**OU2 Operation and Maintenance (O&M)**  
**Capital Cost Sub-Element**  
**Annual Cover Maintenance - Minor Breaches**

Cost Worksheet: CWOM-3

**COST WORKSHEET**

**Site:** OU2 - Former Screening Plant and Surrounding Properties  
**Location:** Lincoln County, Montana  
**Phase:** Operations and Maintenance (O&M)  
**Base Year:** 2012

**Prepared By:** AS **Date:** 6/6/2012**Checked By:** MS **Date:** 6/7/2012**Work Statement:**

This sub-element involves O&M of minor breaches in covers placed during the remedial actions and backfilled areas. If the protective cover can be repaired without additional excavation of contaminated soil, it is considered a minor breach of the protective cover. The following cost includes costs for on-site labor, and O&M allowances for site maintenance.

**Cost Analysis:**

Cost for Soil Cover O&amp;M (Lump Sum)

COST DATABASE CODE	DESCRIPTION	QTY	UNIT(S)	HPF	LABOR	ADJ LABOR	EQUIP	ADJ EQUIP	MATL	OTHER	UNMOD UC	UNMOD LIC	PC OH	PC PF	BUR LIC	COST SOURCE CITATION	COMMENTS
A7A	Operations and Maintenance Crew	6	DY	1.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$454.57	\$454.57	\$2,727.42	8%	9%	\$3,211	MII MII Assemblies	1 day per alternate month
M49	O&M Allowance	20.00	ACR	1.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$103.00	\$103.00	\$2,060.00	0%	0%	\$2,060	A Allowance	Includes cost for cover maintenance, and erosion repair.
<b>TOTAL UNIT COST:</b>															\$5,271		

**Notes:**

HTRW productivity factor is from Exhibit B-3 or B-4 of "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", EPA 2000  
The Cost Database Code is a reference code for linking with line item cost information with the cost source database and is not otherwise used within these cost worksheets.

**Source of Cost Data:**

NA Not Applicable - costs are from previous work or vendor quote

For citation references, the following sources apply:

MII (MII Assemblies), GSA (www.gsa.gov), SE (www.salaryexpert.com), A (Allowance), V (Vendor Quote), CW (Means CostWorks 2010), P (Previous Work), and FRTR (www.frtr.gov)

**Cost Adjustment Checklist:**

**FACTOR:**  
H&S Productivity (labor and equipment only)  
Escalation to Base Year  
Area Cost Factor  
Subcontractor Overhead and Profit  
Prime Contractor Overhead and Profit

**NOTES:**

Field work will be in Level "D" PPE.  
MII assembly costs include HPF adjustments.  
All other costs are escalated based on the USACE CWCCIS, EM 1110-2-1304, Sep 2010.  
An AF of 0.96 is used for Montana, except that an AF of 1.00 (national unmodified average) is used for MII assembly costs and local vendor quotes.  
It is assumed that Subcontractor O&P is either included in the PC O&P or has been factored into vendor quotes or previous work.  
It is assumed that home office OH is 8% and profit is 9% for the Prime Contractor. Professional labor overhead is 100%. Allowances and items with mandated costs such as per diem do not have overhead and profit applied.

**Abbreviations:**

QTY	Quantity	ACR	Acres
EQUIP	Equipment	BCY	Bank Cubic Yard
MATL	Material	CLF	100 Linear Foot
HPF	HTRW Productivity Factor	DY	Days
ADJ LABOR	Adjusted Labor for HFP	EA	Each
ADJ EQUIP	Adjusted Equipment for HFP	LF	Linear Foot
UNMOD UC	Unmodified Unit Cost	HR	Hours
UNMOD LIC	Unmodified Line Item Cost	LB	Pounds
UNBUR LIC	Unburdened Line Item Cost	LCY	Loose Cubic Yard
PC OH	Prime Contractor Overhead	LS	Lump Sum
PC PF	Prime Contractor Profit	RL	Roll
BUR LIC	Burdened Line Item Cost	SY	Square Yard
		TN	Tons

TABLE CWOM-4

**OU2 Operation and Maintenance (O&M)**  
**Capital Cost Sub-Element**  
**Annual Site Inspection**

Cost Worksheet: CWOM-4

**COST WORKSHEET****Site:** OU2 - Former Screening Plant and Surrounding Properties**Prepared By:** AS**Date:** 6/6/2012**Location:** Lincoln County, Montana**Phase:** Operations and Maintenance (O&M)**Checked By:** MS**Date:** 6/7/2012**Base Year:** 2012**Work Statement:**

This sub-element involves the annual site inspection to inspect the integrity of the all the components of the remedy put in place. It includes costs for on-site labor, equipment, materials.

**Cost Analysis:**

Cost for Annual Site Inspection (Lump Sum)

COST DATABASE CODE	DESCRIPTION	QTY	UNIT(S)	HPF	LABOR	ADJ LABOR	EQUIP	ADJ EQUIP	MATL	OTHER	UNMOD UC	UNMOD LIC	PC OH	PC PF	BUR LIC	COST SOURCE CITATION	COMMENTS
A6C	Site Inspection - 1 Person Crew	1	DY	1.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$395.12	\$395.12	\$395.12	8%	9%	\$465	MII MII Assemblies	1 day/year
M11	Site Inspection Report Allowance	1	LS	1.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$1,030.00	\$1,030.00	\$1,030.00	0%	0%	\$1,030	A Allowance	
<b>TOTAL UNIT COST:</b>															<b>\$1,495</b>		

**Notes:**

HTRW productivity factor is from Exhibit B-3 or B-4 of "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", EPA 2000

The Cost Database Code is a reference code for linking with line item cost information with the cost source database and is not otherwise used within these cost worksheets.

**Source of Cost Data:**

NA Not Applicable - costs are from previous work or vendor quote

For citation references, the following sources apply:

MII (MII Assemblies), GSA (www.gsa.gov), SE (www.salaryexpert.com), A (Allowance), V (Vendor Quote), CW (Means CostWorks 2010), P (Previous Work), and FRTR (www.frtr.gov)

**Cost Adjustment Checklist:****FACTOR:**

H&amp;S Productivity (labor and equipment only)

Escalation to Base Year

Area Cost Factor

Subcontractor Overhead and Profit

Prime Contractor Overhead and Profit

**NOTES:**

Field work will be in Level "D" PPE.

MII assembly costs include HPF adjustments.

All other costs are escalated based on the USACE CWCCIS, EM 1110-2-1304, Sep 2010.

An AF of 0.96 is used for Montana, except that an AF of 1.00 (national unmodified average) is used for MII assembly costs and local vendor quotes.

It is assumed that Subcontractor O&amp;P is either included in the PC O&amp;P or has been factored into vendor quotes or previous work.

It is assumed that home office OH is 8% and profit is 9% for the Prime Contractor. Professional labor overhead is 100%. Allowances and items with mandated costs such as per diem do not have overhead and profit applied.

**Abbreviations:**

QTY	Quantity	ACR	Acres
EQUIP	Equipment	BCY	Bank Cubic Yard
MATL	Material	CLF	100 Linear Foot
HPF	HTRW Productivity Factor	DY	Days
ADJ LABOR	Adjusted Labor for HFP	EA	Each
ADJ EQUIP	Adjusted Equipment for HFP	LF	Linear Foot
UNMOD UC	Unmodified Unit Cost	HR	Hours
UNMOD LIC	Unmodified Line Item Cost	LB	Pounds
UNBUR LIC	Unburdened Line Item Cost	LCY	Loose Cubic Yard
PC OH	Prime Contractor Overhead	LS	Lump Sum
PC PF	Prime Contractor Profit	RL	Roll
BUR LIC	Burdened Line Item Cost	SY	Square Yard
		TN	Tons

**TABLE CWOM-5A**

**OU2 Operation and Maintenance (O&M)**  
**Capital Cost Sub-Element**  
**Cover Maintenance - Major Breaches**

Cost Worksheet: CWOM-5A

**COST WORKSHEET**

**Site:** OU2 - Former Screening Plant and Surrounding Properties  
**Location:** Lincoln County, Montana  
**Phase:** Operations and Maintenance (O&M)  
**Base Year:** 2012

**Prepared By:** AS      **Date:** 6/6/2012  
**Checked By:** MS      **Date:** 6/7/2012

**Work Statement:**

This sub-element involves the periodic repair of major breaches in the covers over contaminated areas. The orange construction fence is a visible marker layer to be placed below the repaired areas, if required. This sub-element includes cost for labor, equipment and material (soil from offsite borrow area).

**Cost Analysis:**

Cost for Cover Maintenance - Major Breaches (Lump Sum)

COST DATABASE CODE	DESCRIPTION	QTY	UNIT(S)	HPF	LABOR	ADJ LABOR	EQUIP	ADJ EQUIP	MATL	OTHER	UNMOD UC	UNMOD LIC	PC OH	PC PF	BUR LIC	COST SOURCE CITATION	COMMENTS
	<b>Clean Fill (Subsoil) and Top Soil</b>																
M45	Subsoil, Delivered	100	LCY	1.00	\$0.00	\$0.00	\$0.00	\$0.00	\$8.61	\$0.00	\$8.61	\$861.00	8%	9%	\$1,014	V Vendor Quote	Assume 4 truck loads, Includes purchase and delivery.
M45A	Topsoil Amended, Delivered	25	LCY	1.00	\$0.00	\$0.00	\$0.00	\$0.00	\$35.10	\$0.00	\$35.10	\$877.50	8%	9%	\$1,033	V Vendor Quote	Assume 1 truck loads, Includes purchase and delivery.
	<b>Subsoil Placement Over Contaminated Soil</b>																
A11A	Clean Fill Spreading/Grading	100	LCY	1.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$2.71	\$2.71	\$271.00	8%	9%	\$319	MII MII Assemblies	
A22A	Clean Fill Compaction - Small Area	100	LCY	1.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$2.11	\$2.11	\$211.00	8%	9%	\$248	MII MII Assemblies	
M39A	Orange Fence	250	SF	1.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.09	\$22.50	8%	9%	\$26	V Vendor Quote	Includes purchase and delivery to the Site.
	<b>Topsoil Placement for Cover</b>																
A11A	Clean Fill Spreading/Grading	25	LCY	1.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$2.71	\$2.71	\$67.75	8%	9%	\$80	MII MII Assemblies	
A22A	Clean Fill Compaction - Small Area	25	LCY	1.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$2.11	\$2.11	\$52.75	8%	9%	\$62	MII MII Assemblies	Assume 10% of total fill
<b>TOTAL UNIT COST:</b>															<b>\$2,782</b>		

**Notes:**

HTRW productivity factor is from Exhibit B-3 or B-4 of "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", EPA 2000  
The Cost Database Code is a reference code for linking with line item cost information with the cost source database and is not otherwise used within these cost worksheets.

**Source of Cost Data:**

NA Not Applicable - costs are from previous work or vendor quote

For citation references, the following sources apply:

MII (MII Assemblies), GSA (www.gsa.gov), SE (www.salaryexpert.com), A (Allowance), V (Vendor Quote), CW (Means CostWorks 2010), P (Previous Work), and FRTR (www.frtr.gov)

**Cost Adjustment Checklist:**

FACTOR:  
H&S Productivity (labor and equipment only)  
Escalation to Base Year  
Area Cost Factor  
Subcontractor Overhead and Profit  
Prime Contractor Overhead and Profit

**NOTES:**

Field work will be in Level "D" PPE.  
MII assembly costs include HPF adjustments.  
All other costs are escalated based on the USACE CWCCIS, EM 1110-2-1304, Sep 2010.  
An AF of 0.96 is used for Montana, except that an AF of 1.00 (national unmodified average) is used for MII assembly costs and local vendor quotes.  
It is assumed that Subcontractor O&P is either included in the PC O&P or has been factored into vendor quotes or previous work.  
It is assumed that home office OH is 8% and profit is 9% for the Prime Contractor. Professional labor overhead is 100%. Allowances and items with mandated costs such as per diem do not have overhead and profit applied.

**Abbreviations:**

QTY	Quantity	ACR	Acres
EQUIP	Equipment	BCY	Bank Cubic Yard
MATL	Material	CLF	100 Linear Foot
HPF	HTRW Productivity Factor	DY	Days
ADJ LABOR	Adjusted Labor for HFP	EA	Each
ADJ EQUIP	Adjusted Equipment for HFP	LF	Linear Foot
UNMOD UC	Unmodified Unit Cost	HR	Hours
UNMOD LIC	Unmodified Line Item Cost	LB	Pounds
UNBUR LIC	Unburdened Line Item Cost	LCY	Loose Cubic Yard
PC OH	Prime Contractor Overhead	LS	Lump Sum
PC PF	Prime Contractor Profit	RL	Roll
BUR LIC	Burdened Line Item Cost	SY	Square Yard
		TN	Tons

**TABLE CWOM-5B**

**OU2 Operation and Maintenance (O&M) Cost Worksheet: CWOM-5B**  
**Capital Cost Sub-Element**  
**Contaminated Soil Excavation and Disposal - Major Breaches**

**COST WORKSHEET**

<b>Site:</b> OU2 - Former Screening Plant and Surrounding Properties	<b>Prepared By:</b> AS	<b>Date:</b> 6/6/2012
<b>Location:</b> Lincoln County, Montana	<b>Checked By:</b> MS	<b>Date:</b> 6/7/2012
<b>Phase:</b> Operations and Maintenance (O&M)		
<b>Base Year:</b> 2012		

**Work Statement:**  
 This sub-element involves the periodic repair of a soil cover over contaminated areas. A major breach of the protective covers may result in significant exposure to contaminated soil beneath the cover and additional excavation of contaminated materials would be required to secure the disturbed areas so that the protection of human health is maintained and contaminant migration does not occur.

**Cost Analysis:**  
 Cost for Contaminated Soil Excavation and Disposal - Major Breaches (Lump Sum)

COST DATABASE CODE	DESCRIPTION	QTY	UNIT(S)	HPF	LABOR	ADJ LABOR	EQUIP	ADJ EQUIP	MATL	OTHER	UNMOD UC	UNMOD LIC	PC OH	PC PF	BUR LIC	COST SOURCE CITATION	COMMENTS
	<b>Excavation of Contaminated Soil</b>																
A8A	Excavation/Loading - Contaminated Soils	100	BCY	1.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$9.61	\$9.61	\$961.00	8%	9%	\$1,131	MII MII Assemblies	Assume 4 truck loads
	<b>Hauling and Disposal</b>																
A23A	Hauling Offsite - Former Libby Vermiculite Mine	100	LCY	1.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$6.19	\$6.19	\$619.00	8%	9%	\$729	MII MII Assemblies	Assume 4 truck loads
S3A	Contaminated Soils Handling at the Mine	100	TN	1.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$6.00	\$6.00	\$599.50	8%	9%	\$706	V Vendor Quote	
<b>TOTAL UNIT COST:</b>															<b>\$2,566</b>		

**Notes:**  
 HTRW productivity factor is from Exhibit B-3 or B-4 of "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", EPA 2000  
 The Cost Database Code is a reference code for linking with line item cost information with the cost source database and is not otherwise used within these cost worksheets.

**Source of Cost Data:**  
 NA Not Applicable - costs are from previous work or vendor quote  
 For citation references, the following sources apply:  
 MII (MII Assemblies), GSA (www.gsa.gov), SE (www.salaryexpert.com), A (Allowance), V (Vendor Quote), CW (Means CostWorks 2010), P (Previous Work), and FRTR (www.frtr.gov)

**Abbreviations:**

QTY	Quantity	ACR	Acres
EQUIP	Equipment	BCY	Bank Cubic Yard
MATL	Material	CLF	100 Linear Foot
HPF	HTRW Productivity Factor	DY	Days
ADJ LABOR	Adjusted Labor for HFP	EA	Each
ADJ EQUIP	Adjusted Equipment for HFP	LF	Linear Foot
UNMOD UC	Unmodified Unit Cost	HR	Hours
UNMOD LIC	Unmodified Line Item Cost	LB	Pounds
UNBUR LIC	Unburdened Line Item Cost	LCY	Loose Cubic Yard
PC OH	Prime Contractor Overhead	LS	Lump Sum
PC PF	Prime Contractor Profit	RL	Roll
BUR LIC	Burdened Line Item Cost	SY	Square Yard
		TN	Tons

<b>Cost Adjustment Checklist:</b>	<b>NOTES:</b>
FACTOR:	Field work will be in Level "D" PPE.
H&S Productivity (labor and equipment only)	MII assembly costs include HPF adjustments.
Escalation to Base Year	All other costs are escalated based on the USACE CWCCIS, EM 1110-2-1304, Sep 2010.
Area Cost Factor	An AF of 0.96 is used for Montana, except that an AF of 1.00 (national unmodified average) is used for MII assembly costs and local vendor quotes.
Subcontractor Overhead and Profit	It is assumed that Subcontractor O&P is either included in the PC O&P or has been factored into vendor quotes or previous work.
Prime Contractor Overhead and Profit	It is assumed that home office OH is 8% and profit is 9% for the Prime Contractor. Professional labor overhead is 100%. Allowances and items with mandated costs such as per diem do not have overhead and profit applied.

TABLE CWOM-6

**OU2 Operation and Maintenance (O&M) Cost Worksheet: CWOM-6**  
**Capital Cost Sub-Element**  
**Periodic Hydroseeding of Soil Cover - Major Breaches**

**COST WORKSHEET**

**Site:** OU2 - Former Screening Plant and Surrounding Properties  
**Location:** Lincoln County, Montana  
**Phase:** Operations and Maintenance (O&M)  
**Base Year:** 2012

**Prepared By:** AS **Date:** 6/6/2012  
**Checked By:** MS **Date:** 6/7/2012

**Work Statement:**

This sub-element involves the revegetation of the soil cover and excavation backfill area with hydroseeding. It includes costs for labor, material, and equipment.

**Cost Analysis:**

Cost for Periodic Hydroseeding of Soil Cover (Lump Sum)

COST DATABASE CODE	DESCRIPTION	QTY	UNIT(S)	HPF	LABOR	ADJ LABOR	EQUIP	ADJ EQUIP	MATL	OTHER	UNMOD UC	UNMOD LIC	PC OH	PC PF	BUR LIC	COST SOURCE CITATION	COMMENTS
	<b>Hydroseeding</b>																
A30A	Hydro-Seeding Crew	1.00	ACR	1.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$86.69	\$86.69	\$86.69	8%	9%	\$102	MII MII Assemblies	
M20	Seed, Hydromulch with Fertilizer	43,560	SF	1.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.04	\$0.00	\$0.04	\$1,742.40	8%	9%	\$2,051	CW09 32 92 1914 3100	Includes material
<b>TOTAL UNIT COST:</b>															<b>\$2,153</b>		

**Notes:**

HTRW productivity factor is from Exhibit B-3 or B-4 of "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", EPA 2000  
The Cost Database Code is a reference code for linking with line item cost information with the cost source database and is not otherwise used within these cost worksheets.

**Source of Cost Data:**

NA Not Applicable - costs are from previous work or vendor quote

For citation references, the following sources apply:

MII (MII Assemblies), GSA (www.gsa.gov), SE (www.salaryexpert.com), A (Allowance), V (Vendor Quote), CW (Means CostWorks 2010), P (Previous Work), and FRTR (www.frtr.gov)

**Cost Adjustment Checklist:**

**FACTOR:**  
H&S Productivity (labor and equipment only)  
Escalation to Base Year  
Area Cost Factor  
Subcontractor Overhead and Profit  
Prime Contractor Overhead and Profit

**NOTES:**

Field work will be in Level "D" PPE.  
MII assembly costs include HPF adjustments.  
All other costs are escalated based on the USACE CWCCIS, EM 1110-2-1304, Sep 2010.  
An AF of 0.96 is used for Montana, except that an AF of 1.00 (national unmodified average) is used for MII assembly costs and local vendor quotes.  
It is assumed that Subcontractor O&P is either included in the PC O&P or has been factored into vendor quotes or previous work.  
It is assumed that home office OH is 8% and profit is 9% for the Prime Contractor. Professional labor overhead is 100%. Allowances and items with mandated costs such as per diem do not have overhead and profit applied.

**Abbreviations:**

QTY	Quantity	ACR	Acres
EQUIP	Equipment	BCY	Bank Cubic Yard
MATL	Material	CLF	100 Linear Foot
HPF	HTRW Productivity Factor	DY	Days
ADJ LABOR	Adjusted Labor for HFP	EA	Each
ADJ EQUIP	Adjusted Equipment for HFP	LF	Linear Foot
UNMOD UC	Unmodified Unit Cost	HR	Hours
UNMOD LIC	Unmodified Line Item Cost	LB	Pounds
UNBUR LIC	Unburdened Line Item Cost	LCY	Loose Cubic Yard
PC OH	Prime Contractor Overhead	LS	Lump Sum
PC PF	Prime Contractor Profit	RL	Roll
BUR LIC	Burdened Line Item Cost	SY	Square Yard
		TN	Tons

**TABLE CWOM-7A**

**OU2 Operation and Maintenance (O&M) Cost Worksheet: CWOM-7A**  
**Capital Cost Sub-Element**  
**Mobilization/Demobilization for Repair of Minor Breaches**

**COST WORKSHEET**

<b>Site:</b> OU2 - Former Screening Plant and Surrounding Properties	<b>Prepared By:</b> AS	<b>Date:</b> 6/6/2012
<b>Location:</b> Lincoln County, Montana	<b>Checked By:</b> MS	<b>Date:</b> 6/7/2012
<b>Phase:</b> Operations and Maintenance (O&M)		
<b>Base Year:</b> 2012		

**Work Statement:**  
This sub-element involves mobilization and demobilization of all the required equipment to and from the site respectively.

**Cost Analysis:**  
Cost for Mobilization/Demobilization (Lump Sum)

COST DATABASE CODE	DESCRIPTION	QTY	UNIT(S)	HPF	LABOR	ADJ LABOR	EQUIP	ADJ EQUIP	MATL	OTHER	UNMOD UC	UNMOD LIC	PC OH	PC PF	BUR LIC	COST SOURCE CITATION	COMMENTS
A37C	Mobilization and Demobilization - Small Equipment	2	EA	1.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$295.53	\$295.53	\$591.06	8%	9%	\$696	MII MII Assemblies	
												<b>TOTAL UNIT COST:</b>		\$696			

**Notes:**  
HTRW productivity factor is from Exhibit B-3 or B-4 of "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", EPA 2000  
The Cost Database Code is a reference code for linking with line item cost information with the cost source database and is not otherwise used within these cost worksheets.

**Source of Cost Data:**  
NA Not Applicable - costs are from previous work or vendor quote  
For citation references, the following sources apply:  
MII (MII Assemblies), GSA (www.gsa.gov), SE (www.salaryexpert.com), A (Allowance), V (Vendor Quote), CW (Means CostWorks 2010), P (Previous Work), and FRTR (www.ftr.gov)

**Abbreviations:**

QTY	Quantity	ACR	Acres
EQUIP	Equipment	BCY	Bank Cubic Yard
MATL	Material	CLF	100 Linear Foot
HPF	HTRW Productivity Factor	DY	Days
ADJ LABOR	Adjusted Labor for HFP	EA	Each
ADJ EQUIP	Adjusted Equipment for HFP	LF	Linear Foot
UNMOD UC	Unmodified Unit Cost	HR	Hours
UNMOD LIC	Unmodified Line Item Cost	LB	Pounds
UNBUR LIC	Unburdened Line Item Cost	LCY	Loose Cubic Yard
PC OH	Prime Contractor Overhead	LS	Lump Sum
PC PF	Prime Contractor Profit	RL	Roll
BUR LIC	Burdened Line Item Cost	SY	Square Yard
		TN	Tons

<b>Cost Adjustment Checklist:</b>	<b>NOTES:</b>
FACTOR:	Field work will be in Level "D" PPE.
H&S Productivity (labor and equipment only)	MII assembly costs include HPF adjustments.
Escalation to Base Year	All other costs are escalated based on the USACE CWCCIS, EM 1110-2-1304, Sep 2010.
Area Cost Factor	An AF of 0.96 is used for Montana, except that an AF of 1.00 (national unmodified average) is used for MII assembly costs and local vendor quotes.
Subcontractor Overhead and Profit	It is assumed that Subcontractor O&P is either included in the PC O&P or has been factored into vendor quotes or previous work.
Prime Contractor Overhead and Profit	It is assumed that home office OH is 8% and profit is 9% for the Prime Contractor. Professional labor overhead is 100%. Allowances and items with mandated costs such as per diem do not have overhead and profit applied.

TABLE CWOM-7B

OU2 Operation and Maintenance (O&amp;M)

Cost Worksheet: CWOM-7B

Capital Cost Sub-Element

Mobilization/Demobilization for Repair of Major Breaches

## COST WORKSHEET

Site: OU2 - Former Screening Plant and Surrounding Properties

Prepared By: AS

Date: 6/6/2012

Location: Lincoln County, Montana

Phase: Operations and Maintenance (O&amp;M)

Checked By: MS

Date: 6/7/2012

Base Year: 2012

## Work Statement:

This sub-element involves mobilization and demobilization of all the required equipment to and from the site respectively.

## Cost Analysis:

Cost for Mobilization/Demobilization (Lump Sum)

COST DATABASE CODE	DESCRIPTION	QTY	UNIT(S)	HPF	LABOR	ADJ LABOR	EQUIP	ADJ EQUIP	MATL	OTHER	UNMOD UC	UNMOD LIC	PC OH	PC PF	BUR LIC	COST SOURCE CITATION	COMMENTS
A37C	Mobilization and Demobilization - Small Equipment	2	EA	1.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$295.53	\$295.53	\$591.06	8%	9%	\$696	MII MII Assemblies	
A37D	Mobilization and Demobilization - Self-Propelled Equipment	2	EA	1.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$1,463.50	\$1,463.50	\$2,927.00	8%	9%	\$3,446	MII MII Assemblies	
TOTAL UNIT COST:															\$4,142		

## Notes:

HTRW productivity factor is from Exhibit B-3 or B-4 of "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", EPA 2000

The Cost Database Code is a reference code for linking with line item cost information with the cost source database and is not otherwise used within these cost worksheets.

## Source of Cost Data:

NA Not Applicable - costs are from previous work or vendor quote

For citation references, the following sources apply:

## Cost Adjustment Checklist:

FACTOR:

H&amp;S Productivity (labor and equipment only)

Escalation to Base Year

Area Cost Factor

Subcontractor Overhead and Profit

Prime Contractor Overhead and Profit

## NOTES:

Field work will be in Level "D" PPE.

MII assembly costs include HPF adjustments.

All other costs are escalated based on the USACE CWCCIS, EM 1110-2-1304, Sep 2010.

An AF of 0.96 is used for Montana, except that an AF of 1.00 (national unmodified average) is used for MII assembly costs and local vendor quotes.

It is assumed that Subcontractor O&amp;P is either included in the PC O&amp;P or has been factored into vendor quotes or previous work.

It is assumed that home office OH is 8% and profit is 9% for the Prime Contractor. Professional labor overhead is 100%. Allowances and items with mandated costs such as per diem do not have overhead and profit applied.

## Abbreviations:

QTY	Quantity	ACR	Acres
EQUIP	Equipment	BCY	Bank Cubic Yard
MATL	Material	CLF	100 Linear Foot
HPF	HTRW Productivity Factor	DY	Days
ADJ LABOR	Adjusted Labor for HFP	EA	Each
ADJ EQUIP	Adjusted Equipment for HFP	LF	Linear Foot
UNMOD UC	Unmodified Unit Cost	HR	Hours
UNMOD LIC	Unmodified Line Item Cost	LB	Pounds
UNBUR LIC	Unburdened Line Item Cost	LCY	Loose Cubic Yard
PC OH	Prime Contractor Overhead	LS	Lump Sum
PC PF	Prime Contractor Profit	RL	Roll
BUR LIC	Burdened Line Item Cost	SY	Square Yard
		TN	Tons



TABLE CWOM-8

**OU2 Operation and Maintenance (O&M)**  
**Capital Cost Sub-Element**  
**Borrow Material Sampling**

Cost Worksheet: CWOM-8

**COST WORKSHEET****Site:** OU2 - Former Screening Plant and Surrounding Properties**Prepared By:** AS**Date:** 6/6/2012**Location:** Lincoln County, Montana**Checked By:** MS**Date:** 6/7/2012**Phase:** Operations and Maintenance (O&M)**Base Year:** 2012**Work Statement:**

This sub-element involves determining whether asbestos fibers are present in the borrow source. The following includes the labor, material and equipment cost, and shipping cost required for the borrow material sampling.

**Cost Analysis:**

Cost for Borrow Material Sampling (Lump Sum)

COST DATABASE CODE	DESCRIPTION	QTY	UNIT(S)	HPF	LABOR	ADJ LABOR	EQUIP	ADJ EQUIP	MATL	OTHER	UNMOD UC	UNMOD LIC	PC OH	PC PF	BUR LIC	COST SOURCE CITATION	COMMENTS
A4A	Sampling - 2 Person Crew	1	DY	1.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$834.93	\$834.93	\$834.93	8%	9%	\$983	MII MII Assemblies	
M50	Soil Sample Analysis (PLM-VE)	1	EA	1.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$27.25	\$27.25	\$27.25	8%	9%	\$32	P Previous Work	
M50A	Soil Sample Analysis (Stereomicroscopy)	1	EA	1.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$27.25	\$27.25	\$27.25	8%	9%	\$32	P Previous Work	
M54D	Sample Shipping Allowance	1	LS	1.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$515.00	\$515.00	\$515.00	8%	9%	\$606	A Allowance	
M53D	Sampling/Other Supplies	1	LS	1.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$272.50	\$272.50	\$272.50	8%	9%	\$321	P Previous Work	
<b>TOTAL UNIT COST:</b>															<b>\$1,974</b>		

**Notes:**

HTRW productivity factor is from Exhibit B-3 or B-4 of "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", EPA 2000

The Cost Database Code is a reference code for linking with line item cost information with the cost source database and is not otherwise used within these cost worksheets.

**Source of Cost Data:**

NA Not Applicable - costs are from previous work or vendor quote

For citation references, the following sources apply:

MII (MII Assemblies), GSA (www.gsa.gov), SE (www.salaryexpert.com), A (Allowance), V (Vendor Quote), CW (Means CostWorks 2010), P (Previous Work), and FRTR (www.ftrr.gov)

**Cost Adjustment Checklist:****FACTOR:**

H&amp;S Productivity (labor and equipment only)

Escalation to Base Year

Area Cost Factor

Subcontractor Overhead and Profit

Prime Contractor Overhead and Profit

**NOTES:**

Field work will be in Level "D" PPE.

MII assembly costs include HPF adjustments.

All other costs are escalated based on the USACE CWCCIS, EM 1110-2-1304, Sep 2010.

An AF of 0.96 is used for Montana, except that an AF of 1.00 (national unmodified average) is used for MII assembly costs and local vendor quotes.

It is assumed that Subcontractor O&amp;P is either included in the PC O&amp;P or has been factored into vendor quotes or previous work.

It is assumed that home office OH is 8% and profit is 9% for the Prime Contractor. Professional labor overhead is 100%. Allowances and items with mandated costs such as per diem do not have overhead and profit applied.

**Abbreviations:**

QTY	Quantity	ACR	Acres
EQUIP	Equipment	BCY	Bank Cubic Yard
MATL	Material	CLF	100 Linear Foot
HPF	HTRW Productivity Factor	DY	Days
ADJ LABOR	Adjusted Labor for HPF	EA	Each
ADJ EQUIP	Adjusted Equipment for HPF	LF	Linear Foot
UNMOD UC	Unmodified Unit Cost	HR	Hours
UNMOD LIC	Unmodified Line Item Cost	LB	Pounds
UNBUR LIC	Unburdened Line Item Cost	LCY	Loose Cubic Yard
PC OH	Prime Contractor Overhead	LS	Lump Sum
PC PF	Prime Contractor Profit	RL	Roll
BUR LIC	Burdened Line Item Cost	SY	Square Yard
		TN	Tons

TABLE CWOM-9

**OU2 Operation and Maintenance (O&M) Cost Worksheet: CWOM-9**  
**Capital Cost Sub-Element**  
**Community Awareness Activities During Five-Year Review**

**COST WORKSHEET**

**Site:** OU2 - Former Screening Plant and Surrounding Properties  
**Location:** Lincoln County, Montana  
**Phase:** Operations and Maintenance (O&M)  
**Base Year:** 2012

**Prepared By:** AS **Date:** 6/6/2012

**Checked By:** MS **Date:** 6/7/2012

**Work Statement:**

This sub-element involves setting up a community meeting to inform the local community about the status of Former Screening Plant site during 5-year reviews. The following includes the labor, material and other cost required for setting up the community awareness meeting which includes costs for renting a meeting hall, court reporter, and publishing and sending notices or informational flyers.

**Cost Analysis:**

Cost for Community Awareness Activities (Lump Sum)

COST DATABASE CODE	DESCRIPTION	QTY	UNIT(S)	HPF	LABOR	ADJ LABOR	EQUIP	ADJ EQUIP	MATL	OTHER	UNMOD UC	UNMOD LIC	PC OH	PC PF	BUR LIC	COST SOURCE CITATION	COMMENTS
L12	General Superintendent (P.M.)	16	HR	1.00	\$59.56	\$59.56	\$0.00	\$0.00	\$0.00	\$0.00	\$59.56	\$952.96	100%	9%	\$2,077	SE SalaryExpert.com	8 hrs per day
L13	Project Manager	16	HR	1.00	\$58.90	\$58.90	\$0.00	\$0.00	\$0.00	\$0.00	\$58.90	\$942.40	100%	9%	\$2,054	SE SalaryExpert.com	8 hrs per day
M56	Per Diem for 2 Person	2	DY	1.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$253.38	\$253.38	\$506.76	0%	0%	\$507	GSA www.gsa.gov	
M65	Community Awareness Activities Allowance	1	EA	1.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$2,060.00	\$2,060.00	\$2,060.00	0%	0%	\$2,060	A Allowance	1 meeting per 5-yr review.
<b>TOTAL UNIT COST:</b>															<b>\$6,698</b>		

**Notes:**

HTRW productivity factor is from Exhibit B-3 or B-4 of "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", EPA 2000

The Cost Database Code is a reference code for linking with line item cost information with the cost source database and is not otherwise used within these cost worksheets.

**Source of Cost Data:**

NA Not Applicable - costs are from previous work or vendor quote

For citation references, the following sources apply:

MII (MII Assemblies), GSA (www.gsa.gov), SE (www.salaryexpert.com), A (Allowance), V (Vendor Quote), CW (Means CostWorks 2010), P (Previous Work), and FRTR (www.frtr.gov)

**Cost Adjustment Checklist:**

FACTOR:

H&S Productivity (labor and equipment only)

Escalation to Base Year

Area Cost Factor

Subcontractor Overhead and Profit

Prime Contractor Overhead and Profit

**NOTES:**

Field work will be in Level "D" PPE.

MII assembly costs include HPF adjustments.

All other costs are escalated based on the USACE CWCCIS, EM 1110-2-1304, Sep 2010.

An AF of 0.96 is used for Montana, except that an AF of 1.00 (national unmodified average) is used for MII assembly costs and local vendor quotes.

It is assumed that Subcontractor O&P is either included in the PC O&P or has been factored into vendor quotes or previous work.

It is assumed that home office OH is 8% and profit is 9% for the Prime Contractor. Professional labor overhead is 100%. Allowances and items with mandated costs such as per diem do not have overhead and profit applied.

**Abbreviations:**

QTY	Quantity	ACR	Acres
EQUIP	Equipment	BCY	Bank Cubic Yard
MATL	Material	CLF	100 Linear Foot
HPF	HTRW Productivity Factor	DY	Days
ADJ LABOR	Adjusted Labor for HFP	EA	Each
ADJ EQUIP	Adjusted Equipment for HFP	LF	Linear Foot
UNMOD UC	Unmodified Unit Cost	HR	Hours
UNMOD LIC	Unmodified Line Item Cost	LB	Pounds
UNBUR LIC	Unburdened Line Item Cost	LCY	Loose Cubic Yard
PC OH	Prime Contractor Overhead	LS	Lump Sum
PC PF	Prime Contractor Profit	RL	Roll
BUR LIC	Burdened Line Item Cost	SY	Square Yard
		TN	Tons